California Environmental Protection Agency

O Air Resources Board

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

APPENDICES FOR THE REPORT:

Air Monitoring
Around an Application
of Chlorothalonil and Methamidophos
in San Joaquin County
Summer 2002

Prepared by
Operations Planning and Assessment Section
Quality Management Branch
Monitoring and Laboratory Division

Project No. P-02-002

November 24, 2003

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Appendix I Sampling Protocol



Air Resources Board



Alan C. Lloyd, Ph.D. Chairman

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MEMORANDUM

TO:

John Sanders, Chief

Environmental Monitoring and Pest

Management Branch

Department of Pesticide Regulation

FROM:

ffrey P. Cook, Chief

ర్లో uality Management Branch

Monitoring and Laboratory Division

DATE:

June 6, 2002

SUBJECT:

FINAL PROTOCOL FOR THE 2002 CHLOROTHALONIL APPLICATION

AND AMBIENT AIR MONITORING

Attached is the final "Protocol for Application and Ambient Air Monitoring for Chlorothalonil in Fresno County During Summer, 2002". We received and appreciated your comments (May 16, 2002, memo, Sanders to Cook) on the draft protocol.

If you or your staff have questions or need further information, please contact me at 322-3726 or Kevin Mongar at 322-2249.

Attachment

cc: Randy Segawa, DPR (w/Attachment)
Shifang Fan, DPR (w/Attachment)
Jerry Prieto, Fresno County Agricultural Commissioner (w/Attachment)
David L. Crow, San Joaquin Valley Unified APCD (w/Attachment)
Kevin Mongar

California Environmental Protection Agency

🗩 Air Resources Board

Protocol for the Application and Ambient Air Monitoring for Chlorothalonil In Fresno County During Summer, 2002

> Quality Management Branch Monitoring and Laboratory Division

> > Project No. P-02-002

Date: June 4, 2002

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This protocol has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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Protocol for the Application and Ambient Air Monitoring for Chlorothalonil In Fresno County During Summer, 2002

I. Introduction

At the request (January 2, 2002, Memorandum, Helliker to Lloyd) of the California Department of Pesticide Regulation (DPR), the Air Resources Board (ARB) staff will determine airborne concentrations of the pesticide chlorothalonil in Fresno County over a six-week ambient monitoring program and over a three-day application monitoring program. This monitoring will be done to fulfill the requirements of Assembly Bill (AB) 1807/3219 (Food and Agricultural Code, Division 7, Chapter 3, Article 1.5), which requires the ARB "to document the level of airborne emissions ...of pesticides which may be determined to pose a present or potential hazard..." when requested by the DPR. The ambient monitoring will be conducted for six consecutive weeks between May 26 and July 6, 2002, to coincide with the use of chlorothalonil as a fungicide. California growers primarily use chlorothalonil on tomatoes, potatoes, onion, celery, carrots, and garlic.

The sampling and analysis for chlorothalonil will follow the procedures and quality assurance guidelines described in the "Quality Assurance Plan for Pesticide Air Monitoring" (May 11, 1999 version)(Attachment I) as well as the procedures described in the "Standard Operating Procedure for the Analysis of 2,4,5,6-tetrachloro-1,3-benzenecarbonitrile (Chlorothalonil) in Ambient Air" (Attachment II) and the pesticide adsorbent tube sampling procedures outlined in Attachments III and IV.

II. Sampling

Samples will be collected by passing a measured volume of ambient air through XAD-2 resin. The sampling manifold is shown in Figure 1. The exposed XAD-2 resin tubes (SKC #226-30-06) are stored in an ice chest (on dry ice) or in a freezer until desorbed with organic solvent. The tubes are 8 mm x 110 mm with 400 mg XAD-2 in the primary section and 200 mg in the secondary section. The flow rate of 3.0 standard liters per minute (slpm) will be accurately measured and the sampling system operated continuously for 24 hours (ambient) with the exact operating interval recorded in the log book. The tubes will be protected from direct sunlight and supported about 1.5 meters above the ground during application monitoring sampling periods and 1.5 meters above roof tops for the ambient monitoring. At the end of each sampling period, the tubes will be placed in culture tubes with an identification label affixed. Subsequent to sampling, the sample tubes will be transported on dry ice, as soon as reasonably possible, to the ARB Monitoring and Laboratory Division laboratory for analysis. The samples will be stored in the freezer or extracted/analyzed immediately.

Each sample train consists of an adsorbent tube, Teflon fittings and tubing, rain/sun shield, rotameter (or needle valve), train support, and either a 12 volt DC or a 115 volt AC vacuum pump. Tubes are prepared for use by breaking off the sealed glass ends and immediately inserting the tube into the Teflon fitting. The tubes are oriented in the sample train according to a small arrow printed on the side indicating the direction of flow. A needle valve with a range of 0-5 slpm is used to control sample flow rate. The flow rates will be set using a calibrated digital mass flow meter (MFM), scaled from 0-5 slpm, before the start of each sampling period. The flow rate is also checked and recorded, using the MFM, at the end of each sampling period. Samplers will be leak checked prior to each sampling period, with the sampling tubes installed. Any change in flow rates will be recorded on the field log sheet. The pesticide sampling procedures for adsorbent tubes are included as Attachment III (ambient) and IV (application).

Ambient Monitoring

The DPR recommendations for chlorothalonil request that ambient monitoring occur in Fresno County for 6 consecutive weeks between May 26 and July 6, 2002. Five sampling sites will be selected in relatively high-population areas or in areas frequented by people (e.g., schools or school district offices, fire stations, or other public buildings). At each site, 24 discrete 24-hour samples will be collected, Monday through Friday (4 samples/week), during the 6-week sampling period. Background samples will be collected at the ARB air monitoring site in Fresno. Collocated (replicate) samples will be collected for 6 dates (each Wednesday) at each sampling location.

The sites will be selected by ARB personnel from areas of historic use of chlorothalonil in Fresno County. Sites will be selected for their proximity to the historic use areas with considerations for both accessibility and security of the sampling equipment. ARB understands that DPR staff will verify and quantify the actual use of chlorothalonil that takes place during the study when the information becomes available.

Application Monitoring

The use pattern for chlorothalonil suggests that application-site monitoring should be conducted in Fresno County sometime during the ambient study, and that the monitoring be associated with an application of chlorothalonil at the highest use rate of approximately 5.0 pounds active ingredient per acre. The exact application monitoring schedule will vary based on the type and length of application but will follow the schedule guidelines outlined below in Table 1. Ideally, the monitoring study will include samples taken before, during, and for approximately 72 hours following application.

TABLE 1. GUIDELINES FOR APPLICATION SAMPLING SCHEDULE

Sample period begins:	Sample duration time
Background (pre-application)	24 hours
During application	Length of application time
End of application	1 hour (or up to 1 hour before sunset) 1
1 hour post-application	2 hours (or up to 1 hour before sunset) 1
3 hour post-application	3 hours (or up to 1 hour before sunset) 1
6 hour post-application	6 hours (or up to 1 hour before sunset) 1
1 hour before sunset	Overnight ² (until 1 hour after sunrise)
1 hour after sunrise	Daytime (until 1 hour before sunset)
1 hour before sunset	Overnight (until 1 hour after sunrise)
1 hour after sunrise	24-hour (until 1 hour after sunrise)

- These sample duration times will be adjusted depending on length of application and time of sunset.
- All overnight samples must include the period from one hour before sunset to one hour after sunrise. If the application extends beyond "one hour before sunset", then the overnight sample will be started at the end of application.

Occasionally, a pesticide application may occur over the course of two or more days. In these instances, samples are collected during the first daily application, followed by a sample from the end of application to one hour before sunset (if applicable), followed by an overnight sample, ending at either the start of application or one hour after sunrise the next morning, whichever is first (same for third or more application days). If the day two application does not start at or before 'one hour after sunrise', and the expected time between 'one hour after sunrise' and the start of application is more than two hours, then an additional sample will be collected during this period. Following the end of the final application, samples are collected according to the above schedule, starting with the one-hour sample. As stated above, if the application extends beyond "one hour before sunset", then the overnight sample will be started at the end of application (i.e., no one-, two-, or three-hour samples will be collected post application in this case).

A minimum of 8 samplers will be positioned, one on each side of the field and one in each corner. A ninth sampler will be collocated at one position (downwind). Background (before application) samples should collected for 24 hours. Ideally, samplers should be placed at 20 meters from the field.

The exact location of the application monitoring study has not yet been determined. ARB staff will contact the County Agricultural Commissioner's offices in the Fresno County area to coordinate the selection of a study site and the test dates. The County Agricultural Commissioner's staff will make initial contact with, or will at least provide a list of local contacts for growers, applicators, and/or pesticide control advisers that may be willing to cooperate in conducting the study. Monitoring sites are arranged with the voluntary cooperation of growers and applicators. ARB staff will investigate contacts until a cooperative grower is found and an

appropriate site is selected. Permission to conduct the study will be obtained from the application plot land-owner and owners of adjacent land where samplers will be positioned.

Candidate fields for application monitoring will be 10 acres or larger. The crop type or specific application method for the application study were not specified by the DPR. However, the DPR recommended that, "monitoring should occur at a site using the highest allowed use rates (i.e., 5 pounds Al per acre for chlorothalonil)".

ARB will provide the following information in the monitoring report:

- 1) An accurate record of the positions of the monitoring equipment with respect to the field, including the exact distance that the sampler is positioned from the field;
- 2) An accurate drawing of the monitoring site showing the precise location of the meteorological equipment, trees, buildings, etc.;
- 3) Meteorological data collected at a minimum of 15-minute intervals, including wind speed and direction, humidity, and comments regarding degree of cloud cover;
- 4) The elevation of each sampling station with respect to the field;
- 5) The orientation of the field with respect to North (identified as either true or magnetic north); and
- 6) The start and end time of the application each day.

III. Analysis

The sampling and analytical methods used for this study are based on methods used to conduct similar monitoring (for DPR) in 1992. The "Standard Operating Procedure for the Analysis of 2,4,5,6-tetrachloro-1,3-benzenecarbonitrile (Chlorothalonil) in Ambient Air" (May 17, 2002 draft version) is included as Attachment II. The procedure consists of extraction of the exposed XAD-2 resin with an organic solvent followed by GC/MS analysis. DPR requested a target 24-hour estimated quantitation limit (EQL) of 1.0 nanograms per cubic meter (ng/m³). The EQL actually achieved by the method was 2.3 ng/m³.

IV. Quality Assurance

Field Quality Control for the ambient monitoring will include:

- 1) Four field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling). The field spikes will be obtained by sampling ambient air at the background monitoring site (ARB Fresno site) for 24-hour periods at 3.0 slpm (i.e., collocated with a background sample). One field spike each will be collected during weeks 1, 3, 4, and 6.
- 2) Four trip spikes prepared at the same level as the field spikes.

- 3) Four lab spikes prepared at the same level as the field and trip spikes.
- 4) Collocated (replicate) samples will be taken for six dates (each Wednesday) at each sampling location.
- 5) A trip blank will be obtained each week of sampling.

Field Quality Control for the application monitoring will include:

- 1) Four field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling). The field spikes will be obtained by sampling ambient air during background monitoring at the application site for the same duration as the background samples at 3.0 slpm (i.e., collocated with background samples).
- 2) Four trip spikes prepared at the same level as the field spikes.
- 3) Four lab spikes prepared at the same level as the field and trip spikes.
- 4) Collocated (replicate) samples will be taken for all samples at one of the sampling locations (downwind).
- 5) One trip blank will be obtained during the study.

A chain of custody sheet will accompany all samples. Mass flow meters will be calibrated by the ARB Standards Laboratory. The flow rate of each sampler will be audited by the ARB Quality Assurance Section prior to the monitoring studies.

V. <u>Sample Labeling</u>

Samples for the <u>application</u> study will be labeled using the following format:

Location-Chemical-Sampling Period-Type of Sample

Where:

Location is designated as north 1, 2, or 3 (N1, N2, N3), west (W), south 1, 2, or 3 (S1, S2, S3), and east (E). These designations can be revised as necessary depending on the configuration of the field.

Chlorothalonil is designated as C.

Sampling period is designated as B (for background) or 1 through 9 (# of periods can vary).

The type of sample is designated as S (sample), CO (collocated), TB (trip blank),

TS (trip spike), and FS (field spike).

Examples: S2-C-B-S (South2, Chlorothalonil, background, sample)

S2-C-B-FS (South2, Chlorothalonil, background, field spike)
S2-C-1-S (South2, Chlorothalonil, sampling period 1, sample)
S2-C-1-CO (South2, Chlorothalonil, sampling period 1, collocated)

Samples for the <u>ambient</u> study will be labeled using the following format:

Location-Chemical-Sampling Period-Type of Sample

Where:

Location is designated by 3-letters. The designations will be defined after the sites have been chosen.

Chlorothalonil is designated as C.

Sampling period is designated as 1 through 24 (e.g., 24 periods in 6 weeks).

The type of sample is designated as S (sample), CO (collocated), TB (trip blank), TS (trip spike), and FS (field spike).

Example: ARB-C-1-S (ARB Fresno site, Chlorothalonil, period 1, sample)
ARB-C-1-CO (ARB Fresno site, Chlorothalonil, period 1, collocated)

VI. Personnel

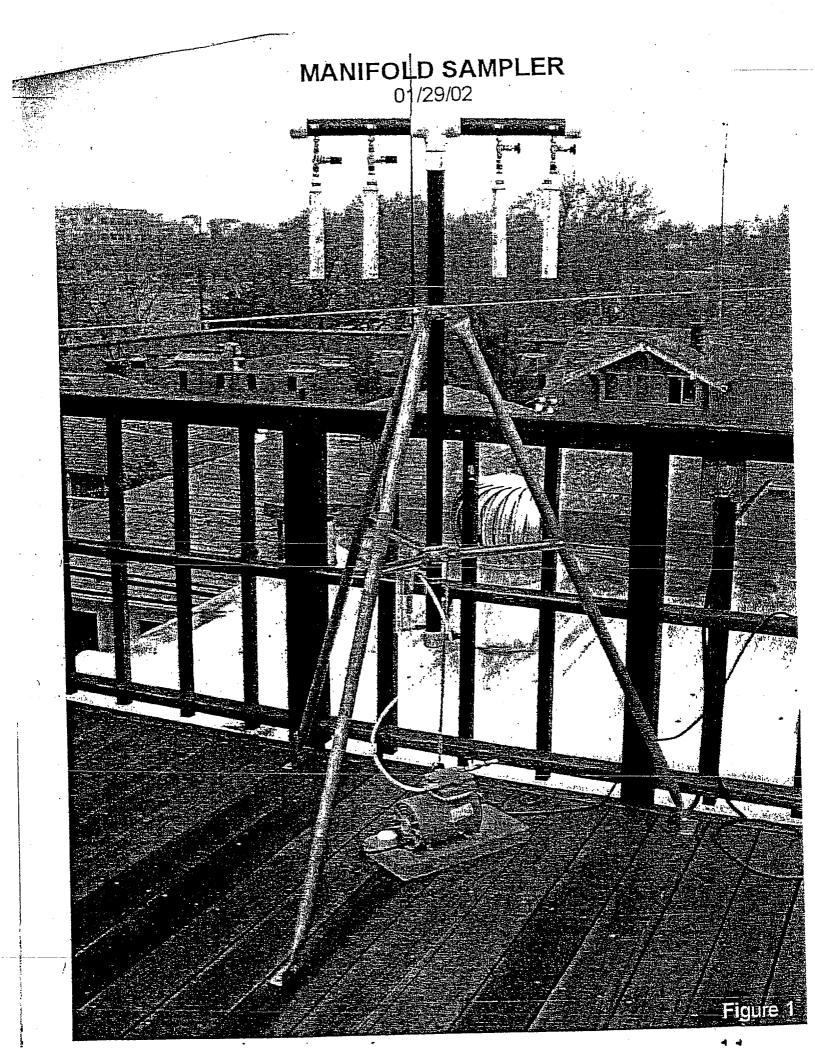
ARB personnel involved with coordinating and conducting the field activities will consist of staff of the Air Quality Surveillance Branch.

VII. <u>Safety Recommendations</u>

The DPR's 'Monitoring Recommendations' include the following safety recommendations:

"The chlorothalonil product labels alert that chlorothalonil is hazardous to humans and domestic animals. Chlorothalonil is corrosive, causes irreversible eye damage, and may cause allergic reactions in some individuals with prolonged or repeated skin contact. Inhalation may be fatal. Chlorothalonil products may be harmful if swallowed or absorbed through the skin."

"The label advises that applicators, mixers, loaders, and other handlers must wear long sleeve shirt and long pants, chemical resistant gloves, shoes and socks, protective eyewear, and a dust/mist filtering mask. The restricted-entry interval varies by product from 12 to 48 hours. Monitoring personnel should refer to the label of the product used and should use proper protective equipment to prevent exposure to the dust or spray mist."



Attachment I

Quality Assurance Plan for Pesticide Air Monitoring

State of California California Environmental Protection Agency Air Resources Board

QUALITY ASSURANCE PLAN FOR PESTICIDE AIR MONITORING

Prepared by the

Monitoring and Laboratory Division Engineering and Laboratory Branch

Revised: May 11, 1999

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This Quality Assurance Plan has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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QUALITY ASSURANCE PLAN FOR PESTICIDE MONITORING

I. Introduction

At the request of the Department of Pesticide Regulation (DPR), the Air Resources Board (ARB) staff determines the airborne concentrations of specified pesticides following monitoring recommendations established by the DPR. This air monitoring is conducted to fulfill the requirements of AB 1807/3219 (Food and Agricultural Code, Division 7, Chapter 3, Article 1.5) which requires the ARB "to document the level of airborne emissions of pesticides which may be determined to pose a present or potential hazard..." when requested by the DPR. The documentation of airborne concentrations is usually accomplished through two types of monitoring. The first consists of five to eight weeks of ambient monitoring in the general area of, and during the season of, peak use of the specified pesticide. The second is monitoring around the perimeter of a field during and for 72 hours after an application has occurred. These are referred to as ambient and application monitoring, respectively. To help clarify the differences between these two monitoring programs, ambient and application are highlighted in bold in this document when the information applies specifically to either program. The purpose of this document is to specify quality assurance activities for the sampling and laboratory analysis of the monitored pesticide.

A. Quality Assurance Policy Statement

It is the policy of the ARB to provide DPR with accurate, relevant and timely air monitoring measurements of airborne pesticide concentrations. The goal of this document is to identify procedures that ensure the implementation of this policy.

B. Quality Assurance Objectives

Quality assurance objectives for pesticide monitoring are as follows.

- (1) to establish the necessary quality control activities relating to site selection, method validation, analytical standard operating procedures (SOP), sample collection, sampling and analysis protocol, data reduction and final reports, and;
- (2) to assess data quality in terms of precision, accuracy and completeness, and;
- (3) to design air monitoring strategies to meet the pesticide target (estimated) quantitation levels as provided by the DPR.

II. Air Monitoring

All sampling will be coordinated through communication with the County Agricultural Commissioner's Office. The local Air Quality Management District (AQMD) or Air Pollution Control District (APCD) will be notified prior to any monitoring. Sample collection will be conducted by staff of the Testing Section or staff of the Air Quality Surveillance Branch of the ARB, or an approved ARB contractor.

A. Siting

The location and time-frame for ambient and application monitoring are based on direction provided by the DPR in their "Use Information and Air Monitoring Recommendation for Pesticide Active Ingredient" documents. These recommendations are based on historical trends (normally 2 to 3 years prior) and are submitted to the ARB by the DPR approximately 1 year in advance of intended monitoring. The recommendations direct ARB to monitor for a pesticide in specific counties during specific use periods. Pesticide use maps (historical) and histograms are used along with close coordination with staff of the County Agricultural Commissioner's Office to predict areas (and times) of use for the pesticide for the upcoming use year. Approximately one month prior to the scheduled monitoring DPR will reevaluate the historical use trends using the most recent pesticide use data available.

For selection of ambient monitoring sites, ARB staff work through authorized representatives of school districts, private companies or city, county or state government agencies. The probe (sampler) siting criteria for ambient pesticide monitoring were obtained from the U.S. EPA "Ambient Air Quality Surveillance" criteria (40 CFR, Part 58) and are listed in TABLE 1. As per the DPR monitoring recommendations, three to five sites are chosen. The monitoring objective in choosing these sites is to estimate population exposure in relatively high-population areas or in areas frequented by people (e.g., schools or school district offices, fire stations, or other public buildings). Sampling sites should be located near (in regions of) specific agricultural crops as recommended by the DPR. One additional site is chosen and designated to be an urban area "background" site which is located away from any expected applications. Information will be collected for each site and reported to DPR regarding; 1) the proximity of the each sampler to treated or potentially treated fields, including the distance and direction, and 2) the distance the sampler is located above the ground. Normally the ambient samplers will be located on the roof of a one-story building (e.g., at schools) with the sample cartridge located about 1.5 meters above the roof.

Probe siting criteria for placement of samplers around a pesticide application are the same as for ambient monitoring tests (TABLE I). A minimum of four samplers are positioned, one on each side of the field. A fifth sampler is collocated at one position, normally the downwind side (based on prevailing breezes). Once monitoring has begun, the sampling stations are not moved, even if the wind direction has changed. Ideally, samplers should be placed at a minimum distance of 20 meters from the perimeter of the field and should be equidistant from the field. These requirements are nearly impossible to meet because of the physical limitations of most application sites. Twenty meters from a potential application field invariably places the sampler on another landowner's property, in another field where tractors and other equipment must operate, or into another orchard where the siting criteria cannot be met. Fences, canals, roads, ditches, railroad tracks, brush, trees, houses, barns, livestock, parked equipment, uncooperative neighbors, etc. are common obstacles. Monitors are placed as far as possible, up to 20 meters, from the field. Attempts are always made to center the samplers on the face of a side of the field. The sampler is placed to maximize the distance from the field and to avoid obstructions bordering the field. Conditions at the site will dictate the actual placement of monitoring stations. Information is collected and reported to DPR regarding; 1) an accurate record of the positions of the monitoring equipment with respect to the field, including the exact distance that

the sampler is positioned from the field; 2) an accurate drawing of the monitoring site showing the precise location of the meteorological equipment, trees buildings and other obstacles; 3) the elevation of each sampling station with respect to the field and the orientation of the field with respect to North (identified as true or magnetic North). Determination of an appropriate site for an application test is based on the "recommendations" provided by the DPR. Parameters used to choose the site are:

- 1. crop type,
- 2. minimum field area of 10 acres,
- 3. minimum application rate (as directed by the DPR),
- 4. type of application (normally no preference by the DPR).
- 5. availability of sites on all four sides of the field which meet the criteria in Table 1 and can be sited 20 meters from the perimeter of the field (quite often this is not possible, i.e., normally 4 sites are chosen but they may not all meet the criteria), and
- 6. accessibility and security of the sampling sites/equipment.

 Monitoring sites (fields) are arranged through communication with, and the voluntary cooperation of, applicators, growers or owners for application monitoring. Normally, representatives of the County Agricultural Commissioner's Office will make initial contact with the applicators/growers or will at least provide a list of possible candidates.

TABLE 1. PESTICIDE PROBE SITING CRITERIA SUMMARY

Height Above Ground (Meters)		2-15		
Minimum Distance from Supporting	Vertical	1		
Structure (Meters)	Horizontal	1		
Other Spacing Criteria		1. Should be 20 meters from trees.		
		2. Distance from sampler to obstacle, such as buildings, must be at least twice the height the obstacle protrudes above the sampler.		
	4:=	3. Must have unrestricted air flow 270° around sampler.		
		4. Samplers at a collocated site (duplicate for quality assurance) should be 2-4 meters apart if samplers are high flow, >20 liters per minute.		

B. Schedule

Samples for ambient pesticide monitoring will generally be collected over 24-hour periods on a schedule of 4 samples per week (Monday through Friday) for 5 to 7 weeks. Occasionally the normal schedule will be interrupted due to holidays and make-up samples may be collected over weekends.

Individual application monitoring schedules will vary based on the type and length of application but will follow the schedule guidelines outlined below in TABLE 2. Ideally, the

monitoring study will include samples taken before, during and for approximately 72 hours following application.

TABLE 2. GUIDELINES FOR APPLICATION SAMPLING SCHEDULE

Sample period begins:	Sample duration time
Background (pre-application)	Minimum of 12 hours
During application	Length of application time
End of application	1 hour (or up to 1 hour before sunset) 1
l hour post-application	2 hours (or up to 1 hour before sunset) 1
3 hour post-application	3 hours (or up to 1 hour before sunset) 1
6 hour post-application	6 hours (or up to 1 hour before sunset) 1
l hour before sunset	Overnight ² (until 1 hour after sunrise)
l hour after sunrise	Daytime (until 1 hour before sunset)
1 hour before sunset	Overnight (until 1 hour after sunrise)
1 hour after sunrise	24-hour (until 1 hour after sunrise)

I These sample duration times will be adjusted depending on length of application and time of sunset.

Occasionally, a pesticide application may occur all day long and over the course of two or more days. In these instances samples are collected during the first daily application, followed by a sample from end of application to 1 hour before sunset, followed by an overnight sample ending at either the start of application or 1 hour after sunrise the next morning (same for second or more application days). Following the end of the application, samples are collected according to the above schedule, starting with the 1-hour sample.

C. Meteorological Monitoring

Data on wind speed and direction, barometric pressure, relative humidity and air temperature will be collected during application monitoring by use of an on-site meteorological station. The meteorological data will be acquired using a data logger at a minimum of 15 minute intervals (averages). Meteorological systems will be calibrated as specified in the ARB manual, "Air Monitoring Quality Assurance, Volume II, Standard Operating Procedures for Air Quality Monitoring." Meteorological data are not collected for the ambient monitoring programs.

² All overnight samples must include the period from one hour before sunset to one hour after sunrise. If the application extends beyond "I hour before sunset" then the overnight sample will be started at the end of application.

III. Method Validation

A. Method Detection Limit

The method detection limit (MDL) is defined as the lowest concentration at which individual measurement results for a specific analyte are statistically different from a blank (that may be zero) with a specified confidence level for a given method and matrix.

MDL is defined as 3.14 x s; where s is equal to the standard deviation of seven replicate spiked samples (e.g., XAD sample cartridges). The spiked samples are prepared and analyzed in the same way as actual samples. The spikes should be prepared at a concentration that is between one to five times the estimated MDL.

B. Estimated Quantitation Limit

The estimated quantitation limit (EQL) is the recommended lowest level for quantitative decisions based on individual measurements for a given method and representative matrix. This EQL is defined as 5 x MDL.

C. Reproducibility

The reproducibility of the method should be determined by performing five replicates at three different concentrations. The lowest level should be at or near the EQL. The average and standard deviation of each set of replicates should be determined and reported.

D. Extraction Efficiency

Extraction efficiency is defined as the amount of pesticide recovered from a spiked sample. Three replicates at two levels and blank should be extracted with the average and standard deviation determined for the replicates. The average amount divided by the amount added multiplied by 100 will give the percent recovery. Recommended recoveries should be between 70-130%.

E. Sampling Efficiency

Sampling efficiency is determined by spiking a sample with a known amount of pesticide. The spiked sample is placed in a sampler and set to the same flow rate and time that samples are collected. At a minimum three replicate spiked samples at a concentration two times the EQL of the method and a collocated background are collected. The samples are extracted and average recovery and standard deviation of the spike samples are determined.

F. Breakthrough

Breakthrough is determined by using a two stage sampling media (usually a filter or resin). The front stage is spiked with a known quantity of the pesticide. The breakthrough study samples are normally spiked at a relatively high level, e.g., at a level that might be observed

during an application study. If time and resources permit, both low and high level spike studies are run. The backup will be the same filter or resin type and placed in series with the front filter or resin. Air is passed through the sampler at the same flow rate and sample time as a real sample (minimum sample time of 24 hours). The front and backstage are recovered and extracted separately. If breakthrough is observed then the sampling strategy must be reviewed, modified and retested before the start of a sampling project.

G. Freezer Storage Stability

Spiked samples should be stored under the same conditions as the samples and for the anticipated time that the samples are stored. Recoveries are determined. A high (either at a level expected during the application study or at the high end of the calibration curve) and a low (1 to 2 times the EQL) concentration set should be studied. A set consists of three replicate spikes each for 3 time intervals.

IV. Field Sampling Quality Control Procedures

Monitoring programs will include the following quality control procedures:

A. Sample Labels

Sample labels will be affixed either directly to the sampling cartridge or will be placed in the individual sample container (e.g., culture tube or zip-lock bag). The sample labels will include at least the following information.

- 1. Pesticide name and the ARB project number.
- 2. Log number
- 3. Sample I.D.
- 4. Monitoring Location
- 5. Sampling end date
- 6. General comments

B. Log Sheets

Field data log sheets will be used to record the sampling log number, sample I.D., start and stop dates, start and stop times, start and end flow rate, initials of individuals conducting sampling, malfunctions, leak checks (at the beginning and end of each sampling period, see Appendix I), weather conditions (e.g., rain) and any other pertinent data which could influence sample results. Refer to Appendix I for a recommended log sheet format.

C. Chain of Custody Forms

Attached as Appendix II is a recommended format for chain of custody (COC) sheets. A COC sheet must accompany any/all samples during transport, transfer or storage. All exchanges of sample possession must be recorded. The laboratory will keep copies of the COCs and

forward the originals to the project engineer. The original COC sheets must be retained in the pesticide project file.

D. Flow Controller Calibration and Audit

Field flow controllers (rotameter, electronic flow controller or critical orifice) shall be calibrated against a referenced standard prior to a monitoring period. This referenced standard (e.g., digital bubble flowmeter or electronic digital mass flowmeter) must be verified, certified or calibrated with respect to a primary standard at least once per year by the Quality Management and Operations Support Branch (QMOSB) of ARB. Appendix V shows an example of a form to document the flow controller calibration results.

A flow audit of the field air samplers will be conducted by the QMOSB before each pesticide monitoring project. If results of this audit indicate a difference from the calibrated values of more than 10%, then the field flow controllers should be rechecked until they meet this objective. A written report of the QMOSB audit results will be included as an appendix in the final monitoring report.

Sampling flow rates should be checked in the field and noted before and after each sampling period. A separate, certified flow meter (i.e., not the one used in the sample train to control flow) will be used to check the flow. The flow rates should be checked after the initial sampling system leak check and before the "end" sampling system leak check.

E. Background Sampling

A background sample will be taken at all sites (4 sides) prior to an application test. The duration of the background sample should be sufficient to achieve the pesticide target 24-hour EQL, as directed by the DPR prior to the test, and must be a minimum of twelve hours and up to 24 hours if scheduling permits. This sample will establish if any of the pesticide being monitored is present in the air prior to the application. It also can indicate if other environmental factors are interfering with the detection of the pesticide of concern during analysis.

While one of the sampling sites for ambient monitoring is referred to as an "urban area background," it is not a background sample in the conventional sense because the intent is not to find a non-detectable level or a "background" level prior to a particular event (or application). This site is chosen to represent a low probability of finding the pesticide and a high probability of public exposure if significant levels of the pesticide are detected at this urban background site. Detectable levels of some pesticides may be found at an urban area background site if they are marketed for residential as well as commercial/agricultural use. An example of an urban area background site is the ARB air monitoring station in downtown Fresno.

F. Collocated Samples

For both ambient and application monitoring, the method precision will be demonstrated in part by collecting samples from collocated samplers (replicate analysis of samples also relates to method precision). An additional ambient sampler will be collocated at each of the sampling

sites. Normally, collocated samples will be collected at each ambient site every Wednesday for each week of sampling. The samplers should be located at least two meters apart if they are high volume samplers (>20 Lpm) in order to preclude airflow interference. This consideration is not necessary for low flow samplers. The collocated sampler for application monitoring should be positioned at the downwind sampling site where the highest concentrations are expected. The collocated site is not changed after the study starts.

G. Trip Blanks

A trip blank should be included with each batch of samples submitted for analysis. This will usually require one trip blank for an application monitoring study and one trip blank per week for an ambient monitoring program. Trip blanks are prepared by opening a sampling cartridge (e.g., breaking the ends of an XAD glass tube) in the field followed by normal labeling and sample transport (i.e., along with the samples).

H. Laboratory, Trip and Field Spikes

The laboratory, trip and field spikes are prepared, extracted and analyzed at the same time and they are generally all spiked at the same level. The laboratory spikes are immediately placed in the laboratory refrigerator (or freezer) and kept there until extraction and analysis. The trip spikes are kept in the freezer until transported to the field. The trip spike samples are kept on dry ice in an ice chest (the same one used for the samples) during transport to and from the field and at all times while in the field except for trip spike sample log-in and labeling. The field spikes are stored and transported in the same way as the trip spikes. However, field spikes are obtained by sampling ambient air through the spiked cartridge at the same environmental and experimental conditions as those occurring at the time of the study.

Ambient field spikes are collocated (same location, flow rate and sampling period) with a sample collected at the urban background sampling site (to minimize background concentrations). Ambient field spikes are normally prepared at a level of approximately 2 times the EQL, or at a level representative of ambient concentrations.

Application study field spikes are collocated with the background samples collected at the four sides of the application site (i.e., one background and one field spike per side). Application field spikes are normally prepared at a level close to expected air concentrations. Field spike results are corrected by subtracting the amount of pesticide residue found in the collocated, unspiked sample before calculation of residue recoveries.

Transportation of Samples

All samples will be capped, placed in a sample container (e.g., culture tube or zip-lock bag) and placed in an ice chest on dry ice immediately following sample collection and labeling. The samples will remain on dry ice until transferred to the laboratory and will then be stored in the lab refrigerator or freezer. Any special handling procedures will be identified during the method validation and will be outlined in the SOP.

J. Meteorological Station Calibration

Meteorological station calibration procedures will be performed as specified by the ARB manual, "Air Monitoring Quality Assurance, Volume II, Standard Operating Procedures for Air Quality Monitoring."

K. Preventive Measures

To prevent loss of data, spare pumps and other sampling materials should be kept available in the field by the operator. A periodic check of sampling pumps, meteorological instruments, extension cords, etc., should be made by sampling personnel.

V. Analysis

Method development and analysis of all field samples must be conducted by a fully competent laboratory. To ensure the capability of the laboratory, a systems audit may be performed, upon request, by the ARB Quality Management and Operations Support Branch (QMOSB) prior to the first analysis per a pesticide project. After a history of competence is demonstrated, an audit prior to each pesticide project is not necessary. However, during each pesticide project, the spiked samples discussed above should be provided to the laboratory to demonstrate accuracy and precision. These spiked samples will be prepared by qualified ARB laboratory staff.

If using GC/MS, isotope dilution is the recommended method for quantitation. Isotope dilution is where the isotope analog of the target compound is spiked to the sample prior to sample preparation. The internal standard goes through the same sample and analytical steps that the target analyte does thus compensating for losses during sample preparation and instrument variability during analysis. When no isotope is available an internal standard is recommended. An internal standard is spiked to the sample just prior to analysis. The internal standard compensates for instrument variability. If no suitable internal standard is found then an external standard method may be used.

VI. Analytical Quality Control Procedures

A. Mass Spectrometer Tuning (if MS is used)

A daily tune shall be performed using perfluorotributyl amine (PFTBA). The MS should be calibrated to optimize the MS for the mode of operation and type of pesticide analyzed. Documentation and performance criteria shall be specified in the standard operating procedure. A record of the tune for each batch should kept on file. A daily tune must be performed prior to the analysis of an analysis sequence and every 24 hours during an analysis sequence. If longer intervals between tunes are used, then the stability of the MS must be demonstrated during the method development phase and approved prior to the sample analysis.

B. Calibration

Initial Calibration

At the beginning of method development an initial multi-point calibration curve is performed to demonstrate the calibration range of the pesticide analyzed. A typical multi-point calibration consists of 5 different concentrations with a single replicate at each concentration. The calibration range usually should not exceed 40:1 with the lowest level standard at the EQL unless there is no need to measure values as low as the EQL. Depending on the linear range of the analyte, multi-points with other than 5 levels may be used although a multi-point with less than 3 levels is not permitted. Typically a linear calibration is preferred although a dynamic range using a quadratic is acceptable. For quadratic calibration curves quantitation can only be performed within the calibration range. Sample above the calibration curve must be diluted into the calibration range and reanalyzed.

Daily Calibration

Prior to the analysis of a set of samples a calibration must be performed. This calibration is called the daily calibration. The daily calibration is either a multi-point calibration or a mid-point calibration. The mid-point calibration consists of a single calibration at the mid-point of the initial multi-point calibration curve. If the mid-point is within a prescribed range (i.e., within +/- 20% of the original calibration) as determined from the initial calibration then the original initial calibration is still considered valid and the response is replaced. If the mid-point calibration is outside that range then another multi-point calibration must be performed. A calibration check at the same level is also run. If the mid-point calibration and the midpoint calibration check are within a prescribed range (i.e., +/-20%) of each other then analysis can begin. If the calibration check is outside the specified range then the problem must be rectified before analysis can begin.

C. Reagent Blanks.

A reagent (solvent) blank is performed at least for every batch of reagent used. The reagent blank uses the same solvent that was used for the sample preparation. The blank should be free of interferences. If low level contamination of the pesticide residue is found in the reagent blank (as may happen when using isotope dilution), then a reagent blank will be performed before analysis of each batch of samples. A reagent blank must be analyzed after any sample which results in possible carry-over contamination.

D. Laboratory Control Blank.

A laboratory blank is run with each batch of samples. A laboratory control blank (blank sampling media, e.g., resin cartridge or filter) is prepared and analyzed by the same procedures as used for field samples. Laboratory blank results must be no higher than 20% of the lowest value reported.

E. Laboratory Control Spike.

A laboratory control spike (LCS) is a resin cartridge spiked (at the level of the midpoint of the daily calibration runs) with a known amount of standard. The LCS is prepared and analyzed the same way as the samples. Two LCS are performed for each batch of samples. Laboratory control spikes need to be within 40% (100*difference/average) of each other and have recoveries that are ±/-30% of the theoretical spiked value. If in the method development stage it is found that the differences or recoveries are larger, then they must be approved by ARB before the analysis can begin.

F. Calibration Check Samples.

A calibration check sample (CCS) is a mid-point standard run after every tenth sample in an analysis set. The purpose of the CCS is to ensure sample drift is within specified values. The CCS sample must be within +/- 25% of its theoretical value. If the standard is outside this range, then the samples associated with that calibration check sample must be reanalyzed. If in the method development stage it is found that the CCS variation is greater than 25%, then the percent variation limit used for the method must be approved by the ELB Branch Chief before the analysis can begin.

G. Duplicate Analysis.

A duplicate analysis is a sample analyzed in duplicate as a measure of analytical precision. Every tenth sample of an analysis set must be run in duplicate.

H. Standard Operating Procedures

Analytical methods must be documented in a Standard Operating Procedure (SOP) before monitoring begins. The recommended format for the SOP is provided in Appendix III. The SOP will include a discussion of all of the procedures outlined above in this section. The SOP will also include a summary of method development results as outlined in Section III above.

VII. Sampling and Analysis Protocol

Prior to conducting any pesticide monitoring, a sampling and analysis protocol, using this document as a guideline, will be written by the ARB staff. The protocol describes the overall monitoring program, the purpose of the monitoring and includes the following topics:

- 1. Identification of the sample site locations, if possible.
- 2. Description of the sampling train and a schematic showing the component parts and their relationship to one another in the assembled train, including specifics of the sampling media (e.g., resin type and volume, filter composition, pore size and diameter, catalog number, etc.).

- Specification of sampling periods and flow rates.
- 4. Description of the analytical method (SOP included if possible).
- 5. Tentative test schedule and expected test personnel.
- 6. Safety information specific to the pesticide monitored.

Specific sampling methods and activities will also be described in the monitoring plan (protocol) for review by ARB and DPR. Procedures which apply to all sampling projects include: (1) sample log sheets (APPENDIX I), (2) chain of custody forms (APPENDIX II), (3) sunlight and rain shields for sample protection during monitoring, (4) sample storage in an ice chest on dry ice until delivery to the laboratory, (5) trip blanks and, (6) laboratory, trip and field spikes. The protocol should include: equipment specifications (when necessary), special sample handling and an outline of sampling procedures. The protocol should specify any procedures unique to a specific pesticide.

VIII. Final Reports and Data Reduction

The mass of pesticide found in each sample should be reported along with the volume of air sampled (from the field data sheet) to calculate the mass per volume for each sample. For each sampling date and site, concentrations should be reported in a table as ug/m³ (microgram per cubic meter) or ng/m³ (nanogram per cubic meter). When the pesticide exists in the vapor phase under ambient conditions, the concentration should also be reported as ppbv (parts per billion, by volume) or the appropriate volume-to-volume units at conditions of 1 atmosphere and 25 °C. Collocated samples should be reported separately as raw data, but then averaged and treated as a single sample for any data summaries. For samples where the end flow rate is different from that set at the start of the sampling period, the average of these two flow rates should be used to determine the total sample volume.

The final report should indicate the dates of sampling as well as the dates of laboratory receipt, extraction and analyses. These data can be compared with the stability studies to determine if degradation of the samples has occurred.

Final reports of all monitoring studies are sent to the Department of Pesticide Regulation, the Office of Environmental Health Hazard Assessment, the Department of Health Services, the Agricultural Commissioner's Office, the local AQMD as well as the applicator and/or the grower. Final reports are available to the public by contacting the ARB Engineering and Laboratory Branch.

A. Ambient Reports

The final report for ambient monitoring should include a map of the monitored area which shows nearby towns or communities and their relationship to the monitoring stations, along with a list of the monitoring locations (e.g., name and address of the business or public building)

including the locations Range/Township/ Section. A site description should be completed for any monitoring site which might have characteristics that could affect the monitoring results (e.g., obstructions). For ambient monitoring reports, information on terrain, obstructions and other physical properties which do not conform to the siting criteria or may influence the data should be described. Information will be collected for each site and reported to DPR regarding; 1) the proximity of the each sampler to treated or potentially treated fields, including the distance and direction, and 2) the distance the sampler is located above the ground.

Ambient data should be summarized for each monitoring location by maximum and second maximum concentration, average ("detected" results are factored in as (MDL+EQL)/2, <MDL results are factored in as MDL/2), total number of samples, number of samples above the estimated quantitation limit (EQL), number of samples "detected" and the number of samples below the MDL. For this purpose, collocated samples are averaged and treated as a single sample.

B. Application Reports

Similarly, a map or sketch indicating the general location (nearby towns, highways, etc.) of the field chosen for application monitoring should be included as well as a detailed drawing of the field itself and the relative positions of the monitors. For application monitoring reports, as much data as possible should be collected about the application conditions (e.g., formulation, application rate, acreage applied, length of application and method of application). This may be provided either through a copy of the Notice of Intent, the Pesticide Control Advisor's (PCA) recommendation or completion of the Application Site Checklist (APPENDIX IV). Meteorological data will be reported in 15 minute averages for the application site during the monitoring period. Meteorological and pesticide air concentration data will also be summarized as wind roses for each application sampling period. The raw meteorological data file will also be transferred to DPR on 1.44 mb floppy disk.

C. Quality Assurance

All quality control and quality assurance samples (blanks, spikes, collocated etc.) analyzed by the laboratory must be reported. Results of all method development and/or validation studies (if not contained in the S.O.P.) will also be reported. The results of any quality assurance activities conducted by an agency other than the analytical laboratory should be included in the report as an appendix. This includes analytical audits, system audits and flow rate audits.

APPENDIX I SAMPLE FIELD LOG BOOK

SAMPLE FIELD LOG BOOK
Project: Pesticide Air Monitoring
Project #:

					roject		_T			
Log #	Sample ID	Date On/Off	Time On/Off	Start Flow	End Flow	Start Leak Check	End Leak Check	Comments	Weather o=overcast pc=partly c=cloudy k=clear	Techn. Initial
								· · · · · · · · · · · · · · · · · · ·		
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APPENDIX II CHAIN OF CUSTODY FORM

CHAIN OF CUSTODY FORM CALIFORNIA AIR RESOURCES BOARD MONITORING AND LABORATORY DIVISION P.O. Box 2815, Sacramento CA 95812 PESTICIDE CHAIN OF CUSTODY

SAMPLE RECORD

	Job Nam Sample I Type of S	Run #: e: Location Sample:		Date: Time:		
ACTION	I D	ATE	TIME	INIT	IALS	METHOD OF
Sample Colle	ected					STORAGE
				GIVEN BY	TAKEN BY	freezer, ice
Transfer						or dry ice
Transfer	į .					
Transfer						
Transfer	1		····			
Transfer Transfer						
Transfer		1		<u> </u>		
LOG# ID#						
				•		
ETURN THIS F	ORM TO:	· · · · · ·				

APPENDIX III

ANALYTICAL STANDARD OPERATING PROCEDURE FORMAT

ELEMENTS TO BE INCLUDED IN LABORATORY STANDARD OPERATING PROCEDURES FOR PESTICIDE AIR ANALYSIS

Engineering and Laboratory Branch Air Resources Board April 1999

I. SCOPE

- A. Description of scope and detection limits of pesticide(s) to be analyzed.
- B. Documents and references upon which method is based.
- C. Definitions of any special terms must be given.

II. SUMMARY OF METHOD

A. General description of sampling and analytical procedure. Enough information should be included for an experienced analyst to readily recognize the principles of operation.

III. INTERFERENCES AND LIMITATIONS

A. Comments made here should cover both analytical and sampling problems, known and potential.

IV. EQUIPMENT AND CONDITIONS

- A. INSTRUMENTATION: As specific a description as possible. Any modifications or improvements of the basic system must have an accompanying schematic. For chromatographic analysis list columns, flow rates, temperatures, detectors, amplifier ranges and attenuations, sample volumes, etc.
- B. AUXILIARY APPARATUS: Provide a description of the function and operating conditions. Include a description of the sampling equipment if the equipment is specific to this method. For example, "Vacuum pump, ACME Model 62, capable of maintaining a 1 CFM Air Flow at 10" vacuum."

V. REAGENTS AND MATERIALS

- A. Provide a list of all reagents used and specify purity and/or grade.
- B. Describe preparation of any special reagents for analysis and sampling.
- C. Specify composition, preparation, and concentrations of stock, intermediate, and working standards.
- D. Describe in detail any necessary safety precautions for handling and disposition of chemicals.

VI. PROCEDURES

A. FIELD SAMPLING TECHNIQUES

- 1. Refer to appropriate Field Sampling S.O.P. for exact details of sampling, chain of custody and sample identification procedures.
- 2. Describe equipment used.
- 3. List sampling conditions: materials, flow rates, etc.
- 4. Describe any potential problems and limitations, with means of controlling such problems.
- 5. Describe any methods used to split samples for other types of analyses, if necessary.

B. LABORATORY SAMPLE PREPARATION/PRETREATMENT TECHNIQUES

- 1. Describe (or refer to an appropriate section of a Laboratory Quality Control Manual) a protocol for sample log-in procedures, including document control and sample examination for damage. Any possible hazards due to toxic or flammable chemicals must be clearly identified. Any sample storage requirements, such as immediate refrigeration or protection for light must be noted.
- 2. Describe any methods used for preconcentration, dilution clean-up filtration, extraction, concentration, etc., after the sample is received from the field.

C. ANAYSIS

- 1. Describe as clearly as possible the exact instrument configuration and set-up techniques
- 2. Describe analysis blank and calibration procedure with associated limits on precision and accuracy. Describe analysis of Control Samples and limits of the resulting data. Describe steps taken in an "out-of-control" situation. Specify the format and location of recorded calibration and Control Sample data.
- 3. Describe sample analysis. Description must include an example of expected data (for example, a sample chromatogram with all components of interest labeled).
- 4. Give calculation procedures for results. Describe data recording and data submittal.

VII. PERFORMANCE CRITERIA

- A. Describe frequency of duplicate analyses, spikes, field blanks, and acceptable limits of each.
- B. Describe frequency of multiple standard analyses to check method linearity and detection limit.
- C. If confirmatory method is used, refer to specific S.O.P.

VIII. METHOD VALIDATION

Validation testing should provide an assessment of accuracy, precision, interferences, method recovery, method detection limit and estimated quantitation limit. Method documentation should include confirmation testing with another method when possible, and quality control activities necessary to routinely monitor data quality control such as use of control samples, control charts, use of surrogates to verify individual sample recovery, field blanks, lab blanks and duplicate analysis. All data should be properly recorded in a laboratory notebook.

The method should include the frequency of analysis for quality control samples. Analysis of quality control samples are recommended before each day of laboratory analysis and after every tenth sample. Control samples should be found to be within control limits previously established by the lab performing the analysis. If results are outside the control limits, the method should be reviewed, the instrument recalibrated and the control sample reanalyzed.

All quality control studies should be completed prior to sampling and include recovery data from at least three samples spiked at least two concentrations. Instrument variability should be assessed with three replicate injections of a single sample at each of the spiked concentrations. A stability study should be done with triplicate spiked samples being stored under actual conditions and analyzed at appropriate time internals. This study should be conducted for a minimum period of time equal to the anticipated storage period. Prior to each sampling study, a conversion/collection efficiency study should be conducted under field conditions (drawing ambient air through spiked sample media at actual flow rates for the recommended sampling time) with three replicates at two spiked concentrations and a blank. Breakthrough studies should also be conducted to determine the capacity of the adsorbent material if high levels of pesticide are expected or if the suitability of the adsorbent is uncertain. The following data will be included in the SOP.

- A. A table describing linearity (correlation coefficients), accuracy (method bias), precision (standard deviations at all levels analyzed), and detection.
- B. Data on sampling efficiencies, stability, pertinent breakdown products, break through volumes and desorption efficiencies.
- C. Data on storage stability and conditions for samples and standards.
- D. References to quality assurance information derived from published and/or interlaboratory sources if available.

APPENDIX IV

APPLICATION CHECKLIST

APPLICATION CHECKLIST

1. Pesticide:
2. County:
3. Crop:
4. Field Address:
E Diald Landian (D. M.(O)
5. Field Location (R/T/S):
6. Field Size (acres):
o. Tield dizz (defes).
7. Contact Person:
8. Background Monitoring Period:
9. Target EQL Met?:
10. Product Applied:
11. Application Rate:
12. Comments on Tank Mix:
12. Confinents on Tank IVIIX.
13. Method of Application (ground, air, irrigation, injection, tarping etc.):
J. J
14. Start of Application:
15. End of Application:
16. Pattern of Application: (e.g., east to west):
17. Weather Conditions:
18. Met Station Location (and elevation):
16. Wet Station Eccation (and Sevanous).
19. Any Other Applications in Area:
20. Sampler Elevations:
Carnera pictures of each sampler from all 4 directions
Camcorder video of each sampler in relation to field and surroundings
Rotameter #s logged Check dimensions of field with known acreage (43560 ft²/acre) & compare sides
Check dimensions of field with known acreage (45360 it facre) & compare sides Crops around field labeled on diagram
Crops around neid labeled on diagram

APPENDIX V FLOW CONTROLLER CALIBRATION FORM

FLOW CONTROLLER; 1-POINT FLOW CALIBRATION SHEET

		Pre:				
Project:		Post :		Project #:	Date	
Desired Flow Rate:				Calib. by:		
			BUBBL	EMETER READING	(nar	ne)
		<u> </u>				
Controller ID:						
Controller Set:				•		
-Readings:	3-10				,	
-Readings:						
-Readings:				<u> </u>		
Average:						. •
Deviation:						
Controller ID:						
Controller Set:						,
-Readings:	***************************************	_			·	
-Readings:		_				
-Readings:						
Average:		•				
Deviation:						
Average of Ave	erages	:				

PROCEDURE

- 1. Set-up sampler as if to collect sample, including filled sample cartridge.
- 2. Set flow controller to achieve desired flowrate and record controller setting.
- 3. Observe and record Bubblemeter flow (on form or direct to floppy Change File name).
- 4. Reset to zero. Then repeat step 3 two more times.
- 5. Calculate the average of 3 readings,
- 6. Repeat steps 1 thru 5 for each Rotameter.
- 7. Average of Averages and Deviation automatically calculated. Replace any Rotameters that deviate by 10% or more from the Average of Averages.
- 8. QA Section will get a copy for comparison with their results for the same setups.

Attachment II

Standard Operating Procedures for the Analysis of Chlorothalonil in Ambient Air

California Environmental Protection Agency

Air Resources Board

Special Analysis Section Northern Laboratory Branch Monitoring and Laboratory Division

Draft

Standard Operating Procedure
Sampling and Analysis of 2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
(Chlorothalonil) in Ambient Air

May 17, 2002

Approved by:

Russell Grace, Manager Special Analysis Section

1. SCOPE

This is a gas chromatography/mass selective detector (GC/MSD) method for determination of 2,4,5,6-tetrachloro-1,3-benzenecarbonitrile (chlorothalonil) from ambient air samples. The method was adapted from the California Air Resources Board Standard Operating Procedure for the Analysis of Chlorothalonil in Ambient Air dated January 1992.

2. SUMMARY OF METHOD

Ambient air is collected on XAD-2 cartridges. Sample cartridges are stored at 4 degrees centigrade (°C) prior to extraction. Samples cartridges are extracted using methylene chloride and an ultrasonic bath. Samples analysis is performed using a GC/MSD in the selected ion-monitoring mode (SIM). Sample analysis and quantitation uses the internal standard Aldrin ¹³C₄, which is added to each extract prior to GC/MSD analysis. Estimated quantitation levels for this method range from approximately 3 nanogram per cubic meter to 300 nanogram per cubic meter (ng/m³) prior to sample dilution.

3. INTERFERENCES / LIMITATIONS

Method interference may be caused by contaminants in solvents, reagents, glassware and the XAD-2 cartridges that can lead to discrete artifacts or elevated baselines. Analysis of samples containing high concentrations of early eluting pesticide components may cause significant contamination of the analytical equipment. Both a system blank and extraction blank must be analyzed with each batch of samples to detect any possible method or instrument interference.

4. EQUIPMENT AND CONDITIONS

A. Instrumentation

Hewlett Packard 5890 Series II gas chromatograph:

Detector: 300° C Injector: 250° C

Column: Restek Rtx-5MS, 30 meters, 0.32 mm i.d., 0.25 µm film thickness, or

equivalent

Temperature Program:

Initial Temperature: 50° C for 1 minute

Ramp 1: 50 to 175° C at 50° C per minute hold for 1 minute Ramp 2: 175 to 250° C at 25° C per minute hold for 0 minutes Final Ramp: 250 to 300° C at 50° C per minute hold for 3 minutes

Splitter opens at 1.0 minute

Carrier gas: Helium at 1.5 ml/minutes constant flow mode

Hewlett Packard 5972 mass selective detector:

Acquisition Mode: SIM

Masses: 5 minutes to 7.45 minutes 264, 266, and 268 for chlorothalonil

Masses: 7.45 to 12 minutes 265, 267, 269 for Aldrin ¹³C₄

Tune File: PFTBA Autotune at maximum sensitivity

B. Auxiliary Apparatus

XAD-2 cartridges (SKC cat # 226-30-6) or equivalent Glass amber vials, 2-ml capacity with septum caps. Sonicator

C. Reagents

Hexane (B&J brand pesticide grade or equivalent) Acetone (B&J brand reagent grade or equivalent) Chlorothalonil 98.5% pure (Chem Service Inc. PS-1020) Aldrin $^{13}\text{C}_4$ 99% pure, 100 µg/ml (Cambridge Isotopes Laboratories Inc. CLM-3347)

D. Gases

Compressed Helium Grade 5 or better

5. SAMPLE COLLECTION

- a) Samples are collected in the field with a maximum flow rate of three (3) liters per minute (lpm).
- b) After collection the samples are place in a glass tube and stored in a cooler at 4° C or less until extracted.
- c) According to EPA method TO-10A the cartridges should be extracted within seven (7) days. An analyte specific holding time should be determined. See section 8F for storage stability summary.

6. SAMPLE EXTRACTON

- a) Prepare a method blank and laboratory control sample (LCS) cartridge with every batch of field samples not to exceed twenty (20) samples in an analytical batch.
- b) Spike the LCS with 20 ng of Chlorothalonil prior to extraction.

- c) Carefully score and break the XAD-2 cartridge just above the glass wool plug and spring on the primary section.
- d) Remove the glass wool plug using forceps.
- e) Pour the XAD-2 resin from the primary section into the glass vial.
- f) Carefully score and break the XAD-2 cartridge just above the glass wool plug on the secondary section.
- g) Carefully using 3.0 ml of methylene chloride rinse the inside of the primary section into the glass vial. Cap tightly.
- h) Retain the secondary section for later analysis to check for breakthrough.
- i) Place all the vials in an ultrasonic bath and sonicate for 30 to 45 minutes.
- j) Filter the extract through a 2.7-micron filter into a second vial and store at 4°C until ready for analysis.

7. ANALYSIS OF SAMPLES

- a) Transfer 1.0 ml of the sample extract to a 1.5-ml amber autosampler vial. Add 30 ng of internal standard (Aldrin ¹³C₄). Sample extract is now ready for analysis.
- b) Prior to sample analysis perform a PFTBA autotune using the maximum sensitivity tune option. Evaluate the tune using the criteria listed in Appendix
 1. If the tune does not meet the criteria, retune. If the tune continues to be unsuccessful, perform corrective maintenance and then retune.
- c) Perform an initial calibration curve using concentrations at or near the EQL to approximately 30 times higher. At least 5 points must be analyzed to establish a calibration curve. Appendix 2 lists the concentrations used when the EQL is approximately 3 ng/m³.
- d) Prepare a sample sequence for the GC/MSD. The sequence should include a continuing calibration verification standard (CCV), and a system blank, for every 10 samples analyzed. If this batch of samples includes a method blank and /or LCS, they should be run prior to field samples to verify that QC criteria have been met.
- e) Because of the nature of the XAD-2 cartridge, extraneous components will be extracted along with the analytes of interest. To minimize excessive carry over of these contaminants from one analysis to the next, a system blank should be run after every 5 to 10 sample or more frequently if indicated by sample chromatograms. In no case should a sample contaminant interfere with the peaks of interest. This will be verified by the absence of a peak in the analyte retention time window during the system blank analysis.
- f) A 2-µl injection volume will be used for all analyses.
- g) Review and edit the quantitation reports as needed.
- h) The samples must be diluted if the analytical results are not within the calibration curve. Every attempt should be made to have the diluted results fall within the upper half of the calibration curve.

- The final results will be adjusted by an appropriate dilution factor and reported in ng/ml.
- j) The atmospheric concentration is calculated according to:

Ambient Sample Conc $(ng/m^3) = \frac{\text{Extract Conc } (ng/ml) \times 3 \text{ ml}}{\text{Air Volume Sampled } (m^3)}$

k) Given instrument sensitivity and a maximum sample of 4.2 m³ the EQL for this method will be approximately 3 ng/m³.

8. QUALITY ASSURANCE

A. Instrument Reproducibility

Establish the reproducibility of the instrument and analytical method as follows: Analyze three different concentrations of standard (low, medium, and high levels) by injecting each five times. The low, mid and high concentrations were 7, 37 and 88 ng/ml, respectively.

B. Linearity

A 6-point calibration is performed. Calibration standards ranging from at or near the EQL to approximately 30 times higher are used for Chlorothalonil. The results are used to calculate calibration curves using linear or quadratic regression. An r^2 of 0.995 or higher is required for an initial calibration to be acceptable. See Appendix 2 for an example calibration curve. A CCV will be run at the start of each analytical batch, and after every tenth sample to verify the system linearity. The CCV quantitated value must be within 25% of the actual value.

C. Method Detection Limit

Method detection limits (MDL) are based on the US EPA MDL calculation. Using the analysis of seven replicates of a low-level standard, the MDL and EQL for Chlorothalonil are calculated as follows:

MDL = 3.143*STD

EQL = 5*MDL

Where STD equals the standard deviation of the calculated results for the seven replicate spikes. The calculated MDL for Chlorothalonil is 0.6432 ng/ml. The EQL for Chlorothalonil using a three-ml extraction volume and a sample collection volume of

4.2 m³ is 2.30 ng/m³. Results above the EQL are reported to three significant figures. Results below the EQL but above the MDL are reported as DET (detected) and results less than the MDL are reported as ND (non-detect).

D. Laboratory Control Sample

A laboratory control sample (LCS) is included with each analytical batch. The LCS stock standard should come from different source or lot then the daily calibration standards. The analytical value of the LCS must be within three standard deviations of it's historical mean. If the LCS is outside of limits then the samples in the analytical batch must be reanalyzed.

E. Collection and Extraction Efficiency (Recovery)

The target compound at a low (20.2 ng/ml) and high (101 ng/ml) level are spiked on XAD-2 cartridges, three at each concentration. The spiked cartridges are placed on field samplers with airflows of 3 Lpm for 24 hours. The samples are extracted with methylene chloride and prepared as described in section 7. The average percent recovery should be \pm 20% of the expected value. The average recoveries were 88% and 89% for the low and high levels. No breakthrough occurred at the levels tested.

F. Storage Stability

Storage stability studies were done in triplicate for 50 ng Chlorothalonil spikes on XAD-2 cartridge primary sections over a period of 21 days.

G. Breakthrough

Three XAD-2 cartridges were spiked with 1 µg of Chlorothalonil to evaluate analyte breakthrough. Air was collected at approximately 3 Lpm for 24 hours. Chlorothalonil was not detected in the back section of the XAD-2 cartridges. Average recovery for Chlorothalonil from the front sections was 92%.

H. Safety

This procedure does not address all of the safety concerns associated with chemical analysis. It is the responsibility of the analyst to establish appropriate safety and health practices. For hazard information and guidance refer to the material safety data sheets (MSDS) of any chemicals used in this procedure.

Appendix 1

Autotune Criteria

A maximum sensitivity autotune should be performed on the detector each day prior to sample analysis. The autotune report should be evaluated for the following:

- 1. Any unusual change in the EM voltage
- 2. Peak width for all tune masses should be between 0.4 amu and 0.6 amu.
- 3. The relative abundance of tune mass 219.0 should be greater than 25% of tune mass 69.0
- 4. Isotope abundance ratio for tune mass 70.0 should between 0.54% and 1.6%; isotope abundance ratio for tune mass 220.0 should be between 3.2% and 5.4%.
- 5. Masses 28 and 18 should be evaluated to check for air leaks in the system.

If autotune criteria are not met the system should be evaluated for problems. After the system problems are corrected the detector should be autotuned prior to sample analysis. Autotune reports should be filed in the instrument autotune folder.

Appendix 2

Calibration Standard Preparation for Chlorothalonil

The certified neat standard used for calibration was purchased from Chem Service Inc., West Chester, Pennsylvania and has the following specification:

Lot No:

276-95A

Expiration date:

February 2007

Chlorothalonil

98.5% pure (solid)

A stock standard with a concentration of approximately 1-milligram (mg) per ml was prepared by weighing 25 mg of chlorothalonil into a 25 ml volumetric flask and bringing to volume with methylene chloride.

Using a serial dilution technique the following calibration standards were prepared in methylene chloride: 3.04, 6.07, 15.18, 25.30, 43.01, 60.72, 91.08, and 121.4 ng/ml.

A minimum of six standards was used to generate the calibration curve, with the standard at 3.04 ng/ml being the low point.

All standard and sample injection used a volume of 2 µl.

Initial calibration curve acceptance requires an r² of at least 0.995.

Attachment III

Pesticide Sampling Procedures for Adsorbent Tubes For Ambient Monitoring Studies

Pesticide Ambient Sampling Procedures For Adsorbent Tubes

Overview:

- -Collect samples over the 6-week sampling period; 24-hour samples; 4 sampling periods per week per site; 5 sampling sites plus an urban background site (ARB Fresno station).
- -Collect a collocated sample from each site each Wednesday,
- -Submit 1 trip blank per week,
- -With the trip blank there normally will be 31 samples collected per week,
- -4 field spikes will be run at the ARB site (time collocated exactly with the ambient sample. The field spikes will be distributed over the monitoring period (e.g., 1 per week on weeks 1, 3, 4, and 6). A trip spike will also accompany each field spike. These field and trip spikes will be logged in and shipped along with the regular samples. The field and trip spikes will be kept on dry ice during transport to and storage in the field.
- -All samples are stored either in an ice-chest on dry ice or in a freezer,
- -The field log sheet is filled out as the sampling is conducted. The originals stay in the field binder. Please include a copy with sample shipments. <u>All</u> QA samples must be logged onto the log sheet.
- -The chain of custody (COC) forms are filled out prior to sample shipment; the originals are shipped with the samples; make and retain copies if desired (not necessary),
- -(Disregard if samples are driven back to Sacramento) The samples are shipped by UPS, next day delivery, to 13th and T. This is normally done each Monday. The original chain of custody sheets must accompany the samples. The samples are shipped on 5 pounds of dry ice. Review the COCs and log sheet to insure that all documentation is correct and that the appropriate QA samples have been included.

Sampling Procedure:

Materials that will be needed on the roof to conduct the sampling include:

- -Clip board with log sheets
- -pencils/pens
- -sample labels
- -sample cartridges
- -end caps
- -plastic test tubes
- -0 to 5 sLpm mass flow meter (MFM) with battery

Figure out your route for sampling the six locations and try to keep this the same throughout

the study. In general, try to make each sampling period 24 hours; e.g., if start time is 11:10 then end time should be 11:10. (round off to the nearest 5 minutes.) The sample period may not always be exactly 24 hours, but that is the target time frame.

Preparation and Set-up

On the way to the first site, plug the MFMs into the batteries. It takes the MFMs about 10 minutes to warm up before they can be used. Leave the MFMs plugged in until the last sample for the day is taken; then unplug for the night to minimize drop in battery charge. Recharge the batteries once per week to be on the safe side.

Upon arrival at the site, check in if needed. Fill out the sample labels for that site. I suggest a backpack and/or fannypacks to carry the stuff to the roof.

Securely attach one adsorbent sample cartridge to the sampling tree. MAKE SURE THE ARROW ON THE CARTRIDGE IS POINTING TOWARDS THE SAMPLE LINE.

Perform the leak check on each sample line by placing a plastic tube cap over the inlet of the cartridge (with the pump on). The rotameter ball should fall to zero. The leak check should be performed before setting the flows with the MFMs.

Using the 5 slpm MFM, set the flow rate exactly to 3.0 slpm.

Make sure that the rain/sun cover is pulled down over the sample tube.

Fill out the log sheet, including: log #, start date, time, start counter reading, leak check OK, any comments, and the weather conditions.

Sample collection and Shipment

Measure (do not re-set) the flow rates at the end of the sampling period with the MFMs; leak check the sample lines; record the end data on the log sheet.

Remove the sample cartridge and cap the ends. Attach the sample label like a flag on the secondary end of the tube. Make sure that the label does not cover the glass wool separating the primary and secondary beds in the cartridge.

Place the cartridge in the plastic test tube shipping container.

Place all the samples for each day (6) in a zip-lock bag and place on <u>dry ice</u> in a cooler or in a freezer. While driving the route the collected samples need to be kept on dry ice.

Collect the collocated (duplicate) samples from each site every Wednesday. These should be started and stopped at the same times as the regular samples.

Collect a trip blank (TB) once per week while at one of the field sites. It doesn't matter

which site (or which day), but note it in the comment section of the log sheet. The TB is collected by breaking the ends off of a tube, capping and labeling as usual, and storing along with the rest of the samples. Log the TB into the log sheet.

Attachment IV

Pesticide Sampling Procedures for Adsorbent Tubes For Application Monitoring Studies

Pesticide Adsorbent Tube Sampling Procedures For Application Studies

Overview:

- -Collect samples according to the schedule in Table 1 of this protocol.
- -Collect 4 background samples, one each from the mid-field sampling positions.
- -Collocate 1 field spike with each of the 4 background samples.
- -Collect a collocated sample from the downwind site for all sampling periods (except the background period).
- -Submit 1 trip blank.
- -The number of samples collected during the study will vary based on the time and duration of the application (refer to Table 1 of the protocol).
- -All samples are stored after sampling either in an ice-chest on <u>dry ice</u> or in a freezer. The trip and field spikes are also kept on dry ice before use in the field.
- -The field log sheet is filled out as the sampling is conducted. All QA samples must be logged onto the log sheet.
- -The chain of custody (COC) forms are filled out prior to sample transfer; the originals are transferred with the samples. Make and retain copies if desired (not necessary).

Sampling Procedure:

Materials that will be needed to conduct the sampling include:

- -Clip board with log sheets
- -pencils/pens
- -sample labels
- -sample cartridges
 - -end caps
 - -plastic test tubes
- -zip-lock bags
- -0 to 5 sLpm mass flow meter (MFM) with batteries
- -ice chest
- -dry ice

Figure out the route for sampling the 8 locations, and keep this the same throughout the study.

Preparation and Set-up

On the way to study site, plug the MFM into the battery. It takes the MFMs about

10 minutes to warm up before they can be used. Leave the MFM plugged in until the last sample is taken; unplug when not in use to minimize drop in battery charge. Recharge the batteries regularly.

Securely attach one adsorbent sample cartridge to the sampling tree. MAKE SURE THE ARROW ON THE CARTRIDGE IS POINTING TOWARDS THE SAMPLE LINE.

Perform the leak check on each sample line by placing a plastic tube cap over the inlet of the cartridge (with the pump on). The rotameter ball should fall to zero. The leak check should be performed before setting the flows with the MFMs.

Using the appropriate MFM, set the flow rate exactly to 3.0 slpm.

Make sure that the rain/sun cover is pulled down over the sample tube.

Fill out the log sheet, including log #, start date, time, start counter reading, leak check OK, MFM Serial #, any comments, and the weather conditions.

Sample collection and Shipment

Measure (do not re-set) the flow rates at the end of the sampling period with the MFM; record the end data on the log sheet.

Remove the sample cartridge and cap the ends. Attach the sample label like a flag on the secondary end of the tube. Make sure that the label does not cover the glass wool separating the primary and secondary beds in the cartridge.

Place the cartridge in the plastic test tube shipping container.

Place all the samples for each period in a zip-lock freezer storage bag and place on <u>dry</u> ice in a cooler.

Collect a trip blank (TB) by breaking the ends off of a tube, capping and labeling as usual, and storing along with the rest of the samples. Log the TB into the log sheet.

Make sure that the trip spikes are labeled and logged-in.

Appendix II

Method Validation Results



Air Resources Board



Alan C. Lloyd, Ph.D. Chairman

1001 | Street • P.O. Box 2815 • Sacramento, California 95812 • www.arb.ca.gov

MEMORANDUM

TO:

Webster Tasat, Manager

Operations Planning and Assessment Section

FROM:

Russell Grace, Manager //s//

Special Analysis Section

DATE:

September 3, 2002

SUBJECT: METHOD VALIDATION DATA FOR ANALYSIS OF CHLOROTHALONIL

The Special Analysis Section provides laboratory support for the pesticide air monitoring program implemented by the ARB at the request of the Department of Pesticide Regulation. One of the responsibilities of the SAS is laboratory analytical method development. By way of this memo, we are providing you with the method validation data generated in the development of the chlorothalonil analytical method for the 2002 monitoring season. The attached tables contain the currently available data generated to determine the method detection limit (MDL), estimated quantitation limit (EQL), reproducibility, collection and extraction efficiency, storage stability and breakthrough.

All of the method development procedures were summarized in the draft standard operating procedure (SOP) for chlorothalonil. This draft SOP was previously provided to you.

If you have any questions, please contact Mr. Michael Orbanosky at 322-2367 or me at 322-0223.

Attachment

cc: Michael Poore T. E. Houston Jim Omand Kevin Mongar

TABLE 1
METHOD DETECTION LIMIT
Chlorothalonil 2002

Date	Name	Amount	Amount	Percent Recovery
		Spiked	quantitated	·
		(ng/ml)	(ng/ml)	
5/1/2002	MDL01	5.06	4.79	94.66
	MDL02	5.06	4.69	92.69
	MDL03	5.06	5.15	101.78
	MDL04	5.06	5.05	99.80
	MDL05	5.06	4.88	96.44
	MDL06	5.06	5.19	102.57
	MDL07	5.06	5.19	102.57
	Av	erage	4.99	98.6
	St	d Dev	0.204	4.04
	MDL	(ng/ml)	0.643	
	EQL	(ng/ml)	3.22	
	Method EQL (ng/m3)		2.24	·

TABLE 2
INSTRUMENT REPRODUCIBILITY

		Chlorothalonil (ng/ml)	
Sample Number	Low Level	Medium Level	High Level
1	7.18	34.91	93.73
2	6.85	38.02	85.24
3	7.43	36.70	86.53
4	7.45	38.14	90.33
5	6.90	38.08	84.07
Average	7.16	37.17	87.98
SD	0.28	1.40	3.98
RSD	3.96	3.76	4.53

Notes:

mlmillilitersRSDRelative standard deviationngnanogramsSDStandard Deviation

TABLE 3

COLLECTION AND EXTRACTION EFFICIENCY

Chlorothalonil 2002

Actual Spike amount (ng/sample)	Chlorothalonil amount (ng/sample)	Percent Recovery	Average	St Dev	RSD
20.2	15.42	76.34			
20.2	17.52	86.73			
20.2	20.73	102.62	88.56	13.2	14.95
101	86.49	85.63	<u> </u>		
101	94.35	93.42			,
101	88.44	87.56	88.87	4.05	4.56

TABLE 4
STORAGE STABILITY
Chlorothalonil 2002

Time (days)	Chlorothalonil Target Amount (ng/sample)	Chlorothalonil Actual Amount (ng/sample)	Percent Recovery	Average	Stdev
0	52.0	52.92	101.77		
	52.0	37.38	71.88		
	52.0	53.43	102.75	92.13	17.54
6	52.0	57.09	109.79		
	52.0	57.87	111.29].	
	52.0	53.55	102.98	108.0	4.42
13	52.0	49.32	94.85		·
	52.0	60.81	116.94		1
	52.0	55.47	106.67	106.2	11.06
24	52.0	51.24	98.54		
	52.0	55.74	107.19		
	52.0	54.39	104.60	103.4	4.44

TABLE 5

BREAKTHROUGH STUDY

Chlorothalonil 2002

Duration (hours)	Primary Bed (ng)	Percent Recovery	Average Percent Recovery	Stdev
24 (1012ng)	861.2 1001.3	85.10 98.95		
	930.7	91.97	92.00	6.92
Duration (hours)	Secondary Bed (ng)	Percent Recovery	Average Percent Recovery	Stdev
24 (1012ng)	ND	NA		
	ND	NA		
	ND	NA	NA	NA

Notes:

ug

Micrograms

Stdev Standard deviation



Air Resources Board



Alan C. Lloyd, Ph.D. Chairman

1001 I Street . P.O. Box 2815 . Sacramento, California 95812 . www.arb.ca.gov

MEMORANDUM

TO:

Webster Tasat, Manager

Operations Planning and Assessment Section

FROM:

Russell Grace, Manager //s//

Special Analysis Section

DATE:

October 30, 2002

SUBJECT: METHOD VALIDATION DATA FOR ANALYSIS OF METHAMIDOPHOS

AND ACEPHATE

The Special Analysis Section provides laboratory support for the pesticide air monitoring program implemented by the ARB at the request of the Department of Pesticide Regulation. One of the responsibilities of the SAS is laboratory analytical method development. By way of this memo, we are providing you with the method validation data generated in the development of the methamidophos and acephate analytical method for the 2002 monitoring season. The attached tables contain the currently available data generated to determine the method detection limit (MDL), estimated quantitation limit (EQL), reproducibility, collection and extraction efficiency, storage stability and breakthrough.

All of the method development procedures were summarized in the draft standard operating procedure (SOP) for methamidophos and acephate. This draft SOP was previously provided to you.

If you have any questions, please contact T.E. Houston, Ph.D., at 322-2365 or me at 322-0223.

Attachment

cc: Michael Poore T.E. Houston Jim Omand Michael Orbanosky Kevin Mongar

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: http://www.arb.ca.gov.

TABLE 1
METHOD DETECTION LIMIT
Methamidophos and Acephate 2002

Date:07/02/02	Methamidophos	Acephate
XAD spikes	(spike: 5 ng/ml)	(spike: 15 ng/ml)
Sample	Amount	Amount
,	Quantitated	Quantitated
1	5.040	25.530
2	4.840	26.080
3	5.030	24.590
4	4.310	23.760
5	4.080	23.400
6	5.060	23.820
7	4.620	25.230
Average	4.711	24.630
Standard Deviation (sd)	0.391	1.017
MDL=3.14*sd	1.227	3.192
EQL=5*MDL	6.133	15.960

TABLE 2
INSTRUMENT REPRODUCIBILITY

Methami	dophos	Acep	hate
Standard	Amount: ng/ml	Standard	Amount: ng/ml
5 ng/ml	5.83	15 ng/ml	17.69
	5.40		16.94
	5.80		17.10
	5.36		15.96
	5.32		15.21
Average	5.54	Average	16.58
Standard Dev.	0.25	Standard Dev.	0.99
40 ng/ml	36.3	80 ng/ml	68.4
	37.4	_	74.1
	37.8		72.9
	36.9		71.8
	36.4		69.2
Average	37.0	Average	71.3
Standard Dev.	0.64	Standard Dev.	2.42
100 ng/ml	96.8	150 ng/ml	146.9
	97.9		152.8
	94.8	<u> </u>	146.1
	95.4		143.5
	98.6		146.3
Average	96.7	Average	147.1
Standard Dev.	1.61	Standard Dev.	3.43

TABLE 3
COLLECTION AND EXTRACTION EFFICIENCY

	Methamidophos	Acephate
Low spikes:	5 ng/ml	15 ng/ml
•	116.5 % +/- 12.4	193.0 % +/- 29.6
High spikes:	70 ng/ml	100 ng/ml
•	46.4 % +/- 2.1	110.9 % +/- 7.4

TABLE 4 STORAGE STABILITY STUDY

	% Recovery Met	% Recovery Methamidophos		y Acephate
Day	low	high	low	high
0	86.6+/- 8.7	98.3 +/- 1.0	148.2 +/- 16	111.5 +/- 1.0
8	133.1 +/- 11	89.4 +/- 2.9	148.0 +/-11.7	118.3 +/- 2.7
14	105.0 +/- 21.9	76.5 +/- 10.6	146.4 +/- 10.3	80.7 +/- 8.0
21	95.2 +/- 7.3	94.1 +/- 3.2	153.2 +/- 5.5	126.5 +/- 7.7

TABLE 5
BREAKTHROUGH STUDY

Date: 09/27/02 XAD-2 Spike (500 ng/ml)	Methamidophos		Ace	ephate
Run at 3LPM for 24 hrs	ng/ml	% recovery	ng/ml	% recovery
XAD Blank	<mdl< td=""><td></td><td><mdl< td=""><td></td></mdl<></td></mdl<>		<mdl< td=""><td></td></mdl<>	
XAD Lab Spike	485.2	97.04	559.3	111.86
Field Spike	441.85	88.37	744.7	148.94
Front Bed	391.6	78.32	675.7	135.14
	330	66.0	753.5	150.70
Average	387.82	77.56	724.63	144.93
Standard Deviation	56.02	11.20	42.61	8.52
Back Bed	<mdl< td=""><td></td><td><mdl< td=""><td></td></mdl<></td></mdl<>		<mdl< td=""><td></td></mdl<>	

Appendix III

Laboratory Report Chlorothalonil

California Environmental Protection Agency

Air Resources Board

2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile (Chlorothalonil) Analytical Results for Application Air Monitoring Samples

DATE: November 2002

Prepared by Michael Orbanosky Air Pollution Specialist

Special Analysis Section Northern Laboratory Branch Monitoring and Laboratory Division

Reviewed and Approved by

Russell Grace, Manager Special Analysis Section

Project Number: P02-002

This report has been reviewed by staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names of commercial products constitute endorsement or recommendation for use.

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1.0 INTRODUCTION

The Department of Pesticide Regulation (DPR) requested the Air Resources Board (ARB) to conduct application air monitoring for 2,4,5,6-tetrachloro-1, 3-benzenedicarbonitrile (chlorothalonil). This report covers the analytical and quality assurance results for a chlorothalonil application occurring over a three (3) day period in San Joaquin county. DPR requested a method estimated quantitation limit (EQL) of one (1) nanogram per cubic meter (ng/m³). The EQL achieved during this project was 2.25 ng/m³

2.0 METHOD DEVELOPMENT

2.1 Overview

XAD-2 cartridges are used for application air sampling. Sample cartridges are stored at or below four (4) degrees centigrade (°C) before extraction. Sample cartridges are extracted with three (3) milliliters (ml) of methylene chloride (DCM) and desorbed in an ultrasonic bath. Sample extracts are analyzed using a gas chromatograph/mass selective detector (GC/MSD), which is operated in the selected ion-monitoring mode (SIM). Sample analysis and quantitation used the internal standard aldrin ¹³C₄, which was added to the extracts before GC/MSD analysis. The estimated quantitation level for this method, based on 4.3 cubic meters (m³) of air collected, and a final extract volume of three (3) ml, is 2.25 ng/m³.

2.2 Calibration Curve

Laboratory staff used standard concentrations of approximately 3, 6, 15, 31, 62, 94, 125, and 158 ng/ml to produce an eight (8) point calibration curve. All calibrations curves performed had a r^2 (variance) greater than or equal to 0.995. Laboratory staff performed calibrations at the beginning of the monitoring program, after instrument maintenance, after remaking of internal standard, and whenever the continuing calibration verification standard (CCV) did not fall within \pm 25 percent (%) of the expected value.

2.3 Method Detection Limit (MDL)

The MDL calculation follows the United States Environmental Protection Agency (USEPA) procedures for calculating MDL's. Using the analysis of seven low-level matrix spikes (5.0 ng/ml), the MDL and EQL for a three (3) ml extract is calculated as follows:

s = the standard deviation of the concentration calculated for the seven replicate spikes. For chlorothalonil: s = 0.2046 ng/ml

 $MDL = (3.14) \times (s) = (3.14) \times (0.2046) = 0.643 \text{ ng/ml.}$ $EQL = (5) \times (MDL) = (5) \times (0.6432) = 3.22 \text{ ng/ml}$ $EQL \text{ for total ng/sample} = 9.66 \text{ ng/sample}^*$

Based on a total collection volume of 4.3 m³ the EQL would be 2.25 ng/m³. Staff report results above the EQL to three (3) significant figures. Results below the EQL but greater than or equal to the MDL are reported as detected (DET). Results less than MDL are reported as <MDL.

2.4 Method Development

Instrument reproducibility, collection and extraction efficiency, storage stability and breakthrough studies were performed and reported in the document "2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile (Chlorothalonil) Method Development and Analytical Results for Ambient Air Monitoring Samples". No additional method development was required for the application project.

3.0 CHLOROTHALONIL APPLICATION AIR MONITORING SAMPLE RESULTS.

The laboratory received 76 application samples plus four (4) field spikes, one (1) field blank, and four (4) trip spikes on September 6, 2002. Table 1 presents the results of the analysis of the chlorothalonil application air samples by site.

4.0 ANALYTICAL QUALITY CONTROL SAMPLES

4.1 System Blanks

Laboratory staff analyzes a system blank with each analytical batch, after each CCV, after every tenth sample and after samples containing high levels of chlorothalonil or co-extracted contaminants. Staff defines the analytical batch as all the samples extracted together, but not to exceed twenty (20) samples. The system blank is run to insure the solvent and instrument do not contribute interferences to the analysis, and to minimize carryover from high level samples. All system blanks were less than the MDL.

4.2 Method Blanks

Laboratory staff analyzed a method blank with each analytical batch. This is an XAD-2 cartridge prepared and analyzed as described for the application samples. Laboratory staff analyzed eight (8) method blanks during this project. All method blank results were less than the MDL.

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^{*} assuming a 3 ml final extract volume

4.3 Laboratory Control Samples (LCS)

Laboratory staff analyzed a LCS with each analytical batch. The stock standard used to prepare the LCS comes from a different source or is a different lot number than the stock standard used for method calibration. A LCS is an XAD-2 cartridge spiked with 50 ng of chlorothalonil. The LCS is extracted and analyzed as described for the samples. The LCS recoveries averaged 112% with a standard deviation of 10.91%.

4.4 Continuing Calibration Verification Standards (CCV)

Following standard lab procedures, laboratory staff analyzed a CCV after every calibration curve, after every tenth (10) sample and at the end of an analytical batch. The CCV must be within ± 25% of the expected value. If any of the CCVs are outside this limit, the affected samples are re-analyzed. The CCV target value for this project was 62.4 ng/ml. All CCV's were within ± 25% of the expected value.

4.5 Laboratory Duplicates

No laboratory duplicates were run with this project.

5.0 FIELD, TRIP, AND LABORATORY SPIKES AND TRIP BLANKS

During the application project, four (4) trip and (4) field spikes along with thirteen (13) laboratory spikes and one (1) trip blank were analyzed. Laboratory staff prepared all spikes at 139 ng/ml of chlorothalonil

5.1 Laboratory Spikes

Table 2 presents the results of the laboratory spikes. The average chlorothalonil recovery was 70.77% with a standard deviation of 20.52%. Two of the laboratory spikes analyzed had very low recoveries (26.94 and 34.23%) for chlorothalonil, which contributed to the high standard deviation. If laboratory staff removes these results from the average and standard deviation calculation, the new average recovery would be 78.07% with a standard deviation of 11.00%.

5.2 Trip Spikes

Table 2 presents the results of the trip spikes. The average recovery for chlorothalonil was 48.06% with a standard deviation of 6.20%.

5.3 Field Spikes

Table 2 presents the results of the field spikes. The field spikes were sampled twenty-four (24) hours before pesticide application. Unspiked collocated samples were

Project P02-002

3

collected along with the spiked samples. The average recovery for the field spikes was 74.18% with a standard deviation of 8.03%. The chlorothalonil quantitations for the samples run concurrently with the field spikes showed values significantly above the EQL (average 89.1 ng/sample). The respective background results were subtracted from the field spike results before recoveries were calculated.

5.4 Trip Blanks

Table 2 presents the results of the trip blanks. One (1) trip blank, with result less than the MDL, was received during this project.

6.0 DISCUSSION

During the project, 76 application samples were analyzed. Sixty-four (64) samples had results greater than the EQL of 9.66 ng/sample. The concentrations ranged from 11.1 to 609 ng/sample. Twelve (12) samples had results reported as detected. No problems or anomalies occurred during these analyses.

Preliminary analysis of twelve application spikes showed average recoveries of 96.5%. This high level of recovery was not duplicated during the application project. Trip spike recoveries were particularly low averaging 48.1%. The field and lab spikes averaged recoveries in the low 70%. A review of the spiking, extraction and analysis procedures did not reveal any gross errors or miscalculations. The field, trip, and laboratory spike samples were reanalyzed to verify initial results and to eliminate any instrument quantitation problems.

LCS spiked at 50 ng/sample and processed in the same way as field samples had recoveries that averaged 112%. This high recovery would indicate that the extraction and analysis process was in control.

Possible sources of analyte loss during the extraction procedure are the spiking step, and the sonication step. During the spiking process analyte maybe lost if, the liquid standard is not completely absorbed onto the XAD-2 resin. During sonication, the extracts heat up and the caps may loosen resulting in analyte loss. During the project it was observed during the post sonication filtering that sample, CA057, trip spike #3, had the vial cap loose enough to fall off. No other caps were noted as being loose after the sonication step.

Table 1: Application Air Monitoring Results San Joaquin County 2002

Site	Log Number	Sample ID	Date Received	Date Analyzed	Chlorothalonil (ng/sample)
EC	8	ECB	9/6/02	9/12/02	8.65E+01
	16	EC-1	9/6/02	9/28/02	7.98E+01
	17	EC-1C	9/6/02	9/28/02	8.55E+01
	25	EC-2	9/6/02	9/28/02	1.05E+02
	26	EC-2C	9/6/02	9/28/02	6.61E+01
	34	EC-3	9/6/02	9/27/02	2.06E+02
	35	EC-3C	9/6/02	9/27/02	2.05E+02
	43	EC-4	9/6/02	9/21/02	3.79E+02
	44	EC-4C	9/6/02	9/21/02	3.83E+02
	52	EC-5	9/6/02	9/20/02	4.32E+02
	53	EC-5C	9/6/02	9/20/02	4.36E+02
	65	EC-6	9/6/02	9/17/02	4.38E+02
1	66	EC-6C	9/6/02	9/17/02	4.29E+02
	74	EC-7	9/6/02	9/14/02	2.59E+02
	75	EC-7C	9/6/02	9/14/02	2.61E+02
ļ	83	EC-8	9/6/02	10/1/02	5.68E+02
	84	EC-8C	9/6/02	10/1/02	5.81E+02
NC	14	NC-1	9/6/02	9/28/02	1.41E+01
}	23	NC-2	9/6/02	9/28/02	DET
	32	NC-3	9/6/02	9/27/02	2.45E+01
	41	NC-4	9/6/02	9/21/02	1.73E+01
	50	NC-5	9/6/02	9/20/02	1.19E+02
	63	NC-6	9/6/02	9/17/02	2.38E+01
	72	NC-7	9/6/02	9/14/02	DET
	81	NC-8	9/6/02	9/13/02	4.98E+01
	6	NCB	9/6/02	9/12/02	1.14E+02
NEC	15	NEC-1	9/6/02	9/28/02	2.19E+01
{	24	NEC-2	9/6/02	9/28/02	DET
1	33	NEC-3	9/6/02	9/27/02	2.90E+01
1	42	NEC-4	9/6/02	9/21/02	2.99E+01
	51	NEC-5	9/6/02	9/20/02	1.80E+02
	64	NEC-6	9/6/02	9/17/02	3.70E+01
1	73	NEC-7	9/6/02	9/14/02	2.50E+01
<u> </u>	82	NEC-8	9/6/02	9/13/02	6.38E+01

Table 1: Application Air Monitoring Results San Joaquin County 2002

Site	Log Number	Sample ID	Date Received	Date Analyzed	Chlorothalonil (ng/sample)
NWC	13	NWC-1	9/6/02	9/28/02	1.11E+01
	22	NWC-2	9/6/02	9/28/02	DET
	31	NWC-3	9/6/02	9/27/02	DET
	40	NWC-4	9/6/02	9/21/02	DET
	49	NWC-5	9/6/02	9/20/02	7.10E+01
	62	NWC-6	9/6/02	9/17/02	2.18E+01
	71	NWC-7	9/6/02	9/14/02	DET*
	80	NWC-8	9/6/02	9/13/02	1.26E+01
SC	10	SC-1	9/6/02	9/28/02	1.33E+02
	19	SC-2	9/6/02	9/28/02	3.25E+01
	28	SC-3	9/6/02	9/27/02	8.78E+01
	37	SC-4	9/6/02	9/21/02	1.12E+02
ĺ	46	SC-5	9/6/02	10/1/02	6.09E+02
	59	SC-6	9/6/02	9/17/02	3.70E+02
	68	SC-7	9/6/02	9/17/02	8.17E+01
	77	SC-8	9/6/02	9/13/02	1.16E+02
	2	SCB	9/6/02	9/12/02	7.19E+01
SEC	18	SEC-1	9/6/02	9/28/02	1.66E+02
	27	SEC-2	9/6/02	9/28/02	8.68E+01
	36	SEC-3	9/6/02	9/27/02	1.03E+02
l	45	SEC-4	9/6/02	9/21/02	2.03E+02
	54	SEC-5	9/6/02	9/20/02	3.98E+02
	67	SEC-6	9/6/02	9/17/02	3.77E+02
	76	SEC-7	9/6/02	9/14/02	9.17E+01
	85	SEC-8	9/6/02	9/13/02	2.72E+02
swc	11	SWC-1	9/6/02	9/28/02	DET
	20	SWC-2	9/6/02	9/28/02	1.40E+01
	29	SWC-3	9/6/02	9/27/02	DET
1	38	SWC-4	9/6/02	9/21/02	DET
	47	SWC-5	9/6/02	9/20/02	1.92E+02
	60	SWC-6	9/6/02	9/17/02	6.08E+01
1	69	SWC-7	9/6/02	9/13/02	DET
1	78	SWC-8	9/6/02	9/13/02	2.96E+01

Table 1: Application Air Monitoring Results San Joaquin County 2002

Site	Log Number	Sample ID	Date Received	Date Analyzed	Chlorothalonil (ng/sample)
wc	12	WC-1	9/6/02	9/28/02	1.71E+02
	21	WC-2	9/6/02	9/28/02	5.82E+01
	30	WC-3	9/6/02	9/27/02	1.18E+01
	39	WC-4	9/6/02	9/21/02	2.48E+01
	48	WC-5	9/6/02	9/20/02	1.84E+02
{	61	WC-6	9/6/02	9/17/02	8.85E+01
	70	WC-7	9/6/02	9/13/02	DET
	79	WC-8	9/6/02	9/13/02	5.87E+01
	4	WCB	9/6/02	9/12/02	8.40E+01

Table 1 Notes: Application Monitoring Results, San Joaquin County 2002

If analytical result is \geq MDL and < EQL it is reported in the table as detected (DET). Levels at or above the EQL are reported as the actual measured value and are reported to three significant figures.

ng = nanogram

Sample ID (Sample identification) numbers followed by the letter C are collocated samples for the samples with the corresponding number.

Site location identification:

SC:

South

SWC:

South West

WC:

West

NWC:

North West

NC: NEC: North

North East

EC:

East

SEC:

South East

Table 2: Field QC Sample Results Chlorothalonil Application San Joaquin County 2002

Quality	Laboratory	Date	Chlorothalonil	Percent
Control	1D	Analyzed	amount	Recovery*
Туре			(ng/sample)	
Lab Spike	L001R	9/12/02	336.81	80.96
(416 ng)	L002R	9/12/02	351.24	84.43
	L003R	9/12/02	112.05	26.94
	L004R	9/12/02	142.41	34.23
İ	L91202	9/13/02	363.81	87.45
	L91602	9/17/02	244.17	58.69
	L91702AR	9/20/02	308.07	74.06
	L91702BR	9/20/02	345.48	83.05
	L91802A	9/20/02	353.13	84.89
	L91802B	9/20/02	361.56	86.91
	L92002R	9/27/02	351.27	84.44
	L92002A	9/28/02	232.47	55.88
	L92302	9/28/02	324.69	78.05

Field Spike	SCB-FS	9/12/02	394.95	77.65
(416 ng)	WCB-FS	9/12/02	402.30	76.51
	NCB-FS	9/12/02	373.32	62.36
	ECB-FS	9/12/02	420.12	80.21

Trip Spike	ECB-TS	9/12/02	181.62	43.66
(416 ng)	SC-6-TS-1	9/17/02	191.73	46.09
	SC-6-TS-2	9/17/02	188.31	45.27
	SC-6-TS-3	9/17/02	238.11	57.24

Trip Blank	SC-6-TB	9/16/02	<mdl< th=""></mdl<>

Notes:

Field spike valves corrected by subtracting background values ID

Identification

<MDL Less than method detection limit

Nanograms

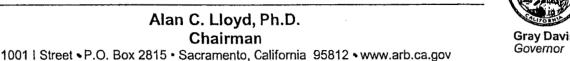
Appendix IV

Laboratory Report Methamidophos



Air Resources Board

Alan C. Lloyd, Ph.D. Chairman





MEMORANDUM

TO:

Webster Tasat, Manager

Operations Planning and Assessment Section

FROM:

Russell D. Grace, Manager

Special Analysis Section

DATE:

July 25, 2003

SUBJECT:

REVISED ANALYTICAL REPORT FOR 2002 METHAMIDOPHOS

APPLICATION AIR MONITORING

The Special Analysis Section (SAS) provided laboratory support for the methamidophos pesticide application air monitoring project conducted in the San Joaquin County during 2002. The SAS laboratory performed analyses on application samples collected and issued a report, titled "Air Sampling Cartridge Analytical Results of Application Monitoring in San Joaquin County for Methamidophos" on November 21, 2002.

This report has been revised correcting a few typographical errors and clarifying the reported estimated quantitation limit (EQL).

If you have any questions or comments, please contact T. E. Houston, Ph.D., of my staff at 322-2365 or me at 322-8959.

Attachment ...

cc: Michael Poore Kevin Mongar T. E. Houston Jim Omand Michael Orbanosky

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: http://www.arb.ca.gov.

California Environmental Protection Agency

Air Resources Board

Air Sampling Cartridge Analytical Results of Application Monitoring in San Joaquin County for Methamidophos.

DATE: July 23, 2003 Version 1

Prepared by: T.E. Houston, Ph.D. Air Pollution Specialist

Special Analysis Section Northern Laboratory Branch Monitoring and Laboratory Division

Reviewed and Approved by

Russell Grace, Manager Special Analysis Section

Project Number: P02-003

This report has been reviewed by staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names of commercial products constitute endorsement or recommendation for use.

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1.0 INTRODUCTION

The Department of Pesticide Regulation (DPR) requested the Air Resources Board (ARB) to conduct application air monitoring of methamidophos. This report covers the analytical and quality assurance results for methamidophos during an application in San Joaquin County. DPR requested an application method estimated quantitation limit (EQL) of fifty (50) nanograms per cubic meter (ng/m³).

2.0 METHOD DEVELOPMENT

2.1 Overview

XAD-2 cartridges are used for application air sampling. Sample cartridges are stored at or below four (4) degrees centigrade (°C) before extraction. Sample cartridges are extracted with three (3) milliliters (ml) of 10% acetone in ethyl acetate (EA) and desorbed in an ultrasonic bath. Sample extracts are analyzed using a gas chromatograph with a flame photometric detector (GC/FPD). Sample analysis and quantitation used the internal standard diazinon, added to the extracts before GC/FPD analysis. The EQL for this method, based on 4.3 cubic meters (m³) of air collected and a final extract volume of three (3) ml, is 4.28 ng/m³

2.2 Calibration Curve

The standard concentrations for methamidophos were 5, 10, 20, 40, 60, and 100 ng/ml to produce a six (6) point calibration curve. All calibration curves performed had a r² (variance) greater than or equal to 0.995. A calibration curve was run before each analytical sample batch. The analytical sample batch is the samples and the quality controls run for a given 24 hour period.

2:3 Method Detection Limit (MDL)

The MDL calculation follows the United States Environmental Protection Agency procedures for calculating MDL's. Using the analysis of seven low-level matrix spikes, the MDL and EQL for a three (3) ml extract is calculated as follows:

s = the standard deviation of the concentration calculated for the seven replicate spikes. For methamidophos: s = 0.391 ng/ml

MDL = (3.14) x (s) = (3.14) x (0.391) = 1.227 ng/ml.

EQL = (5) x (MDL) = (5) x (1.227) = 6.133 ng/ml

EQL for total ng/sample = 18.40 ng/sample*

* assuming a 3 ml final extract volume

DPR requested the ambient EQL (1.0 ng/m³) be used for the study if preliminary analysis indicated ambient concentration. The low calibration standard of 15 ng/sample is used for convenience of standards preparation, and thus 15 ng/sample (5.0 ng/m³) is the reporting EQL. Staff report results above the EQL to three (3) significant figures. Results below the EQL but greater than or equal to the MDL are reported as detected (DET). Results less than MDL are reported as <MDL.

2.4 Method Development

Instrument reproducibility, collection and extraction efficiency, storage stability, and breakthrough studies were performed and reported in the document "Air Sampling Cartridge Method Development and Analytical Results of Ambient Monitoring in Fresno County for Methamidophos and Acephate" (2002). No additional method development was required for the application project.

3.0 APPLICATION AIR MONITORING SAMPLE RESULTS.

The laboratory received a total of 85 application samples including four (4) field spikes, four (4) trip spikes, and one (1) trip blank on September 6, 2002. Table 1 presents the results of the analysis of the methamidophos by site.

4.0 ANALYTICAL QUALITY CONTROL SAMPLES

4.1 Solvent Blanks

Laboratory staff analyzed a solvent blank with each analytical batch, after each calibration check standard, after every tenth sample and after samples containing high levels of methamidophos or co-extracted contaminants. The system blank was run to ensure the solvent and instrument did not contribute interferences to the analysis, and to minimize carryover from high level samples. All system blanks were less than the MDL.

4.2 Method Blanks

Laboratory staff analyzed a method blank with each batch of samples for extraction. This was an XAD-2 cartridge prepared and analyzed as described for the application samples. Laboratory staff analyzed eight (8) method blanks during this project. All method blanks were less than the MDL.

4.3 Laboratory Control Samples (LCS)

Laboratory staff analyzed a LCS with each analytical batch. The LCS was an XAD-2 cartridge spiked, extracted, and analyzed as described for the samples. The first two LCS analyzed were spiked at 250 ng/ml, in anticipation of higher concentrations for the application. With the observed lower concentrations of the samples, the remaining LCS

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were spiked at 70 ng/ml of methamidophos. The overall LCS recoveries averaged 103.4% +/- 14.7%.

4.4 Calibration Check Standard (CCS)

Following standard lab procedures, laboratory staff analyzed a CCS after every calibration curve, after every tenth (10) sample and at the end of each analytical batch. The CCS must be within +/- 25% of the expected value. If any of the CCS's are outside this limit, the affected samples are re-analyzed after recalibration. The CCS for each analytical batch is 70 ng/ml for methamidophos.

4.5 Laboratory Duplicates

No laboratory duplicates were run with this project.

5.0 FIELD, TRIP, AND LABORATORY SPIKES AND TRIP BLANKS

During the application project four(4) field, (4) trip, and (4) laboratory spikes and one (1) trip blank were analyzed. All spikes were prepared at 250 ng/ml of methamidophos.

5.1 Field Spikes

Table 2 presents the results of the field spikes. The field spikes were sampled 24 hours before pesticide application. Unspiked collocated samples were collected along with the spiked samples. The average recovery of the field spikes was 82.26% +/- 3.52%. The collocated unspiked samples were below the MDL.

5.2 Trip Spikes

Table 2 presents the results of the trip spikes. The average recovery was 75.59% +/-14.67%.

5.3 Laboratory Spikes

Table 2 presents the results of the laboratory spikes. The average recovery was 106.4% +/- 2.2%.

5.4 Trip Blanks

Table 2 presents the result of the trip blank. One (1) trip blank received during this project with results less than the MDL.

6.0 DISCUSSION

During the project, 76 application samples were analyzed. Thirty-eight (38) had results greater than the EQL of 15 ng/sample. The concentrations ranged 16.2 to 570 ng/sample. Three (3) samples had results reported as detected. Confirmation of the methamidophos in the samples is not possible with the current method. However, a compilation of the field spikes was sent to the California Department of Food and Agriculture laboratory for analysis confirming the identity of the methamidophos on their GC system.

All other project QC was acceptable and no other problems or anomalies were observed during this project.

Table 1: Application Air Monitoring Results
San Joaquin County 2002

Site: Background

Log	Sample Id	Date	Date	Methamidophos
Number		Sampled	Analyzed	ng/sample
2	SMB	09/02/02	09/10/02	<mdl< td=""></mdl<>
4	WMB	09/02/02	09/10/02	<mdl< td=""></mdl<>
6	NMB	09/02/02	09/10/02	<mdl< td=""></mdl<>
8	EMB	09/02/02	09/10/02	<mdl< td=""></mdl<>

Site: SM

Log	Sample Id	Date	Date	Methamidophos
Number		Sampled	Analyzed	ng/sample
10	SM1	09/03/02	09/12/02	359
19	SM2	09/03/02	09/13/02	31.6
28	SM3	09/03/02	09/16/02	36.9
37	SM4	09/03/02	09/16/02	16.8
46	SM5	09/03/02	09/17/02	570
59	SM6	09/04/02	09/18/02	61.9
68	SM7	09/04/02	09/19/02	22.2
77	SM8	09/05/02	09/23/02	<mdl< td=""></mdl<>

Site: SWM

Log Number	Sample Id	Date Sampled	Date Analyzed	Methamidophos ng/sample
Hambot	Gampio /a	0 0111710	,	
11	SWM1	09/03/02 09/03/02	09/12/02 09/13/02	<mdl <mdl< td=""></mdl<></mdl
20 29	SWM2 SWM3	09/03/02	09/16/02	<mdl< td=""></mdl<>
38 47	SWM4 SWM5	09/03/02	09/16/02 09/17/02	<mdl 102</mdl
60	SWM6	09/04/02	09/18/02	<mdl< td=""></mdl<>
69 78	SWM7 SWM8	09/04/02	09/19/02	<mdl <mdl< td=""></mdl<></mdl
	3.7.110	33,30,02		

Table 1: Application Air Monitoring Results
San Joaquin County 2002

Site: WM

Log		Date	Date	Methamidophos
Number	Sample Id	Sampled	Analyzed	ng/sample
		·		
12	WM1	09/03/02	09/12/02	225
21	WM2	09/03/02	09/13/02	31.3
30	WM3	09/03/02	09/16/02	<mdl< td=""></mdl<>
39	WM4	09/03/02	09/16/02	<mdl< td=""></mdl<>
48	WM5	09/03/02	09/17/02	87.7
61	WM6	09/04/02	09/18/02	<mdl< td=""></mdl<>
70	WM7	09/04/02	09/19/02	<mdl< td=""></mdl<>
79	WM8	09/05/02	09/23/02	<mdl< td=""></mdl<>

Site: NWM

Log	Sample Id	Date	Date	Methamidophos
Number		Sampled	Analyzed	ng/sample
	ou.iipio iu			3
13	NWM1	09/03/02	09/12/02	<mdl< td=""></mdl<>
22	NWM2	09/03/02	09/13/02	<mdl< td=""></mdl<>
31	NWM3	09/03/02	09/16/02	<mdl< td=""></mdl<>
40	NWM4	09/03/02	09/16/02	<mdl< td=""></mdl<>
49	NWM5	09/03/02	09/17/02	<mdl< td=""></mdl<>
62	NWM6	09/04/02	09/18/02	<mdl< td=""></mdl<>
71	NWM7	09/04/02	09/19/02	<mdl< td=""></mdl<>
80	NWM8	09/05/02	09/23/02	<mdl< td=""></mdl<>

Table 1: Application Air Monitoring Results
San Joaquin County 2002

Site: NM

Log	Sample Id	Date	Date	Methamidophos
Number		Sampled	Analyzed	ng/sample
14 23 32 41 50 63 72 81	NM1 NM2 NM3 NM4 NM5 NM6 NM7	09/03/02 09/03/02 09/03/02 09/03/02 09/03/02 09/04/02 09/04/02 09/05/02	09/12/02 09/13/02 09/16/02 09/16/02 09/17/02 09/18/02 09/19/02 09/23/02	DET <mdl DET <mdl 23.3 <mdl <mdl <mdl< th=""></mdl<></mdl </mdl </mdl </mdl

Site: NEM

Log Number	Sample Id	Date Sampled	Date Analyzed	Methamidophos ng/sample
15	NEM1	09/03/02	09/12/02	21.1
24	NEM2	09/03/02	09/13/02	<mdl< td=""></mdl<>
33	NEM3	09/03/02	09/16/02	DET
42	NEM4	09/03/02	09/16/02	<mdl< td=""></mdl<>
51	NEM5	09/03/02	09/17/02	55.0
64	NEM6	09/04/02	09/18/02	<mdl< td=""></mdl<>
73	NEM7	09/04/02	09/19/02	<mdl< td=""></mdl<>
82	NEM8	09/05/02	09/23/02	<mdl< td=""></mdl<>
-				

Table 1: Application Air Monitoring Results
San Joaquin County 2002

Site: EM

Log		Date	Date	Methamidophos
Number	Sample Id	Sampled	Analyzed	ng/sample
	·			
16	EM1	09/03/02	09/12/02	122
17	EM1C	09/03/02	09/12/02	99.5
25	EM2	09/03/02	09/13/02	154
26	EM2C	09/03/02	09/13/02	184
34	EM3	09/03/02	09/16/02	191
35	EM3C	09/03/02	09/16/02	: 184
43	EM4	09/03/02	09/16/02	182
44	EM4C	09/03/02	09/16/02	182
52	EM5	09/03/02	09/17/02	291
53	EM5C	09/03/02	09/17/02	297
65	EM6	09/04/02	09/18/02	31.6
66	EM6C	09/04/02	09/18/02	27.4
74	EM7	09/04/02	09/19/02	53.5
75	EM7C	09/04/02	09/19/02	62.8
83	EM8	09/05/02	09/23/02	104
84	EM8C	09/05/02	09/23/02	110
	<u></u>			

Site: SEM

Log	Sample Id	Date	Date	Methamidophos
Number		Sampled	Analyzed	ng/sample
18	SEM1	09/03/02	09/12/02	221
27	SEM2	09/03/02	09/13/02	41.5
36	SEM3	09/03/02	09/16/02	25.0
45	SEM4	09/03/02	09/16/02	83.1
54	SEM5	09/03/02	09/17/02	340
67	SEM6	09/04/02	09/18/02	23.9
76	SEM7	09/04/02	09/19/02	16.2
85	SEM8	09/05/02	09/23/02	26.1

Table 1 Notes: Application Monitoring Results, San Joaquin County 2002

The EQL and MDL reported are based on the lowest calibration standard. MDL = 3.0 ng/sample EQL= 15 ng/sample

If analytical result is ≥ MDL and < EQL it is reported in the table as detected (DET). Levels at or above the EQL are reported as the actual measured value and are reported to three significant figures.

Sample ID (Sample identification) numbers followed with the letter C are collocated samples for the samples with the corresponding number.

Site location identification:

SM:

South

SWM:

South West

WM:

West

NWM:

North West

NM:

North

NEM:

North East

EM:

East

SEM:

South East

Table 2: XAD-2 Field, Trip, and Laboratory Spikes and Trip Blank Results

3	Methami	dophos
Sample Identification	Amount (ng/ml)	%Recovery
SMBFS1#1 WMBFS2#3 NMBFS3#5 EMBFS4#7	193.9 210.1 204.4 214.2	77.6 84.0 81.8 85.7
	SMBFS1#1 WMBFS2#3 NMBFS3#5	SMBFS1#1 193.9 WMBFS2#3 210.1 NMBFS3#5 204.4

Trip Spikes		Methami	dophos
Date	Sample Identification	Amount(ng/ml)	%Recovery
11-Sept	EMBTS4#9	241.5	96.6
17-Sept	SM6TS1#55	186.2	74.5
, i	SM6TS2#56	160.3	64.1
	SM6TS3#57	167.9	67.2
,			

Laboratory Spikes		Methami	Methamidophos			
Date	Sample Identification	Amount(ng/ml)	%Recovery			
11-Sept	#1 #2 #3 #4	263.5 260.4 273.0 267.3	105.4 104.2 109.2 106.9			

Trip Blank Date	Sample Identification	Methamidophos
17-Sept	SM6TB#58	<mdl< td=""></mdl<>

Appendix V

Notice of Intent to Apply Restricted Materials and Pesticide Use Recommendation

STATE OF CALIFORNIA
DEPARTMENT OF PESTICIDE REGULATION

NOTICE OF INTENT TO APPLY RESTRICTED MATERIALS

						,					
	Nursery										
County	Section							erty Operator	Applicator Na	me and Add	ress
39 (San Joaquin)	16	01 N 08 E SMH Air Ground TRIPLEE FARMS							TOM GUIDO		
Operator ID		0.				Site Identification N	lumber				1
39-02 - 390	00224								Stockton, C	a	
Location								Block ID			
N MARIP				<u> </u>				<u> </u>		,	
	ate / Time A					Units Treated	Commodi	ty / Site Treated.			
Propos	sed	Actual			beac	Actual	TOMAT	OES FRESH			
09/04/2		artification and			6	Adoptili de la companya de la compa	- ــــــــــــــــــــــــــــــــــــ				
Chem # N	Man. / Name	e of Product	Applied		EPA/	Calif. Reg. # (Label)		oduct Proposed	Rate Proposed	Dilution	Target Pest
	VALENT	•			50630	-D0056-AA-D0000	A Commission of	9.00	2.00 Pts /	30 Gal	Aphids
_ 1	MONITOF	4 SPRAY			29039	-00000-777-00000		PT OF GA	Treated Ac		- тринос
	ZENECA							13 50 1 45	3.00 Pts /	20.0-1	1 -l- DB-bi
	BRAVO V	VEATHER-	STIK				LB	PT OT GA	Treated Ac	30 Gal	Late Blight
	ROHM &	HAAS			20707		Por Side	2:25	8.00 Oz /	20.0-1	Beet
L . 10	CONFIRM 2F 00707-00238-AA-00		-00238-AA-00000	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PT OT GA	Treated Ac	30 Gal	Armyworm			
	DUPONT			<u> </u>			Contracti	2.25	8.00 Oz /	20.0-1	Tomato
	ASANA XL INSECTICIDE 00352			2-00515-AA-0000	LB LOZ	PT OT GA	Treated Ac	1 311 (521)			
	CMR			1055	Lo. College		135	1,00 Pts /	20 05	*	
i	NO FOAN	ΛВ -			10507	75-50008-AA-00	LEB OZ	Z PT OT GA	100 Gal	30 Gal	*exempt*
										,	

Days Reentry	Days PreHarves	t Applied	i / Supervise	d By	NW	N I	NE
72 Hours	7	Primaria de la compansión de la compansi				!	
Environmental Change	s / Comments					\\ 1 `	
59D10	•				W	Target	E
Submitted By	· D	ate	Time	PCA Name		<u> </u>	
				IN HOUSE USE		1 1	
Received By	В	ox Number	Date	Approved	sw	1 1 S	SE
<u> </u>				Denled	Adjacent Crop	s, Schools, Dv	rellings, etc.
Field: E 45-20	Rec# 13	6					CDMS ATOOBE

Submit to AGRICULTURAL COMMISSIONER at least 24 hours before application

FAXED

n.1

PESTICIDE USE RECOMMENDATION

TRIPLE E PRODUCE 8690 WEst Linne Road Tracy, CA 95376 209-463-2310 # 136

Date: 09-03-02

Proposed: 09-04-02

Expires: 09-09-02

Crop: TOMATOES FRESH

Area: 77; Proposed: 36 Acres

Apply by: Ground; Gallons/Treated Acre: 30

Delivery Ticket #:

Purchase Order #: 3643 Pest, Permit#: 39-02-3900224 Grower: TRIPLE E FARMS

PO BOX 239

Tracy, CA 209-463-2310

Appir: TOM GUIDO Fldmn: IN HOUSE USE

Field E 45-20 Site & Location N MARIPOSA RD California San Joaquin Prop. Acr | Field

36

Site & Location

California

Prop. Acr

2 40 20 11 11 11 001 (110		•				
Material	REG.#	RATE	/100 gal	Band	Mat. Req.	
MONITOR 4 SPRAY	59639-00056-AA-00000	2.00 Pts / Treated Ac	6.67 Target Pest: A	60"	9.00 gal	W
AI: METHAMIDOPHOS BRAVO WEATHER-STIK	50534-00188-AA-10182	3.00 Pts / Treated Ac	10,00	60"	13.50 gal	M*
Al: CHLOROTHALONIL CONFIRM 2F	00707-00238-AA-00000	ZENECA 8.00 Oz / Treated Ac	Target Pest: La 26.67		2,25 gal	M*
AI: TEBUFENOZIDE	1	ROHM & HAAS	Target Pest: B 26.67		vorm 2.25 gal	R.4*
ASANA XL INSECTICIDE AI: ESFENVALERATE	00352-00515-AA-00000	8.00 Oz / Treated Ac	Target Pest: T		itworm	
NO FOAM B	1050775-50008-AA-000	1.00 Pts / 100 Gal	1,00 Target Pest: *	60" "tomaxe	1.35 gal	M
AI: SPREADER, ACTIVATOR,	burrek	CIVIT	Tarque T Cos.	OKOIII PC		

SPECIAL INSTRUCTIONS

Mix with: DO NOT COMBINE BRAVO WEATHER-STIK WITH DIPEL 4L, FOIL, TRITON AG-98, TRITON B-1956 OR LATRON B-1956 AS

PHYTOTOXICITY MAY RESULT.

MIX WITH: LATRON CS-7 AT 1 PT/100 GAL. (OR SIMILAR SPREADER-BINDER) IS RECOMMENDED.

NO FOAM B: DO NOT USE AT A RATE WHICH EXCEEDS 5% OF FINISHED VOLUME.

APPLICATOR MUST POSSESS SPECIAL LABELING

MONITOR 4 SPRAY

24C Registration #: CA-790096

Growth Stage(s): W/MITICIDE-FUNGICIDE-INSECTICIDE *

PRECAUTIONS

*Restricted; YES, CERTIFIED APPLR ONLY

Permit Required

Notice of Intent Required

Chemical Category: I DANGER Closed Mixing System Required

Feed/Graze Treated Area/Crop: NO

Days to Harvest: 7

Avoid Drift, Water Contamination Toxic to Bees *, Fish, Birds

Posting Required

Non Re-entry Interval; 72 Hours Plantback Restriction: YES

"NOTIFY BEEKEEPERS AT LEAST 48 HRS BEFORE APPLICATION.

CRITERIA / ENVIRONMENTAL CHANGES

59D10

The execution of this recommendation certifies that alternative and mitigation measures that would substantially lessen any significant adverse impact on the environment have been considered and, if feasible, adopted.

IN HOUSE USE

Signature:

Grower Signature:

*** RECOMMENDATION CONTINUES ON NEXT PAGE ***

PESTICIDE USE RECOMMENDATION CONTINUED - PAGE2

136 Date: 09-03-0

>rop: TOMATOES FRESH >rower: TRIPLE E FARMS

Field; E 45-20		NMARIPOSA RD	NW	N
Soil pH: 7	01N08E-16M	Total Area; 77 Acres		
% Organic Matter. 1		Proposed Area : 36 Acres	W	Target
Texture: Clay		PCA; IN HOUSE USE		
Pest. Permit#: 39-02-3900224				1 1
			SW	

RESTRICTIONS / LIMITATIONS

MONITOR: This product is extremely toxic to birds and other wildlife. Birds and other wildlife in treated areas may be killed. Do not apply directly to water, areas where surface water is present or to intertidal areas below the mean high water mark. This product is highly toxic to bees exposed to direct treatment residues on blooming crops or weeds. Do not apply or allow to drift to blooming crops or weeds if bees are visiting treatment area. Spray as needed a day intervals. Do not apply more than 5 applications per crop season.

BRAVO WEATHER-STIK: This product is toxic to fish, equatic invertebrates, and marine/estuarine organisms. Runoff from treated areas may be hazardo aquatic organisms in neighboring areas. DO NOT apply directly to water, to areas where surface water is present, or to intercidal areas below the mean hill water mark. DO NOT contaminate water when disposing of equipment wash waters. DO NOT apply when weather conditions favor drift from treated area BRAVO WEATHER-STIK can be used effectively in dilute or concentrate sprays. Thorough, uniform coverage is essential for disease control. DO NOT u greenhouse-grown crops. DO NOT combine BRAVO WEATHER-STIK in spray tank with pesticides, surfactants, or fertilizers, unless your prior use has set the combination physically compatible, effective, and noninjurious under your conditions of use. DO NOT combine BRAVO WEATHER-STIK with DiPel 4 Foil, Triton AG-98, Triton B-1956, or Latron B-1956 as phytotoxicity may result. **** Apply in sufficient water to obtain adequate coverage. Begin applicative when dew or rain occur and disease threatens. Use the highest rate and shortest interval specified when disease conditions are severe, BRAVO WEATH STIK may be combined in the spray tank with EPA-registered pesticide products that claim copper as the active ingredient and are labeled for control of bacterial diseases of tomatoes, Check the copper manufacturer's label for specific instructions, precautions, and limitations prior to mixing with BRAVO WEATHER-STIK. DO NOT use with Copper-Count N in concentrated spray suspension. For foliage disease, apply 1.375-2 pts/A every 7-10 days. For fit disease, apply 2-3 pts/A every 7-14 days beginning at fruit set.

CONFIRM 2F: The following rotational crops may be planted at intervals defined below following the final application of CONFIRM 2F at the recommendarates for a registered use. Crops for which CONFIRM use is registered: No restrictions, All other crops: 30 days, | This product is toxic to aquatic invertebility and runoff may be hazardous to aquatic organisms in neighboring areas. Under some conditions, this chemical may also have a high potential for no into surface water for several weeks or months after application. Do not cultivate within 10 feet of aquatic areas so as to allow growth of a vegetative filter Drift from applications of this pesticide is likely to result in damage to sensitive aquatic invertebrates in water bodies adjacent to the treatment area. For terrestrial uses, do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark, except ur forest canopy when aerially applied to control forest pests. Do not contaminate water when disposing of equipment washwaters and rinsate. Do not apply weather conditions favor drift or runoff from areas treated. This pesticide demonstrates the properties and characteristics associated with chemicals dete groundwater. The use of this chemical in areas where solls are permeable, particularly where the water table is shallow, may result in groundwater contamination. *** Apply 6 to 8 oz./acre for early-season applications only to young crop and small plants. Begin applications when first signs of feeding damage appear or when infestations reach threshold levels as defined by Cooperative Extension Service or other qualified professional authorities. Appl oz./acre for mid- to late-season applications and to heavier infestations and under conditions in which thorough coverage is more difficult. Under heavy infestations, continuous moth flights and/or hits subside. Do not apply more than 16 fluid ounces per application and do not exceed 64 fluid ounces per application and do not exceed 64 fluid ounces pe

ASANA XL: All rotational crops may be planted immediately following last application.] Apply in sufficient diluent to provide uniform coverage. Do not approduct or allow it to drift to blooming crops if bees are visiting the treatment area. Drift and runoff from treated areas may be hazardous to aquatic orga in neighboring areas. Do not tank mix ASANA XL with fungicides containing fentin hydroxide (triphenyltin hydroxide) as crop injury may result. OBSERV FOLLOWING PRECAUTIONS WHEN SPRAYING IN THE VICINITY OF AQUATIC AREAS SUCH AS LAKES; RESERVOIRS; RIVERS; PERMANENT STREAMS, MARSHES, OR NATURAL PONDS; ESTUARIES AND COMMERCIAL FISH FARM PONDS. Do not apply by ground within 25 feet, or by a 160 feet of lakes; reservoirs; rivers; permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds. Increase the buffer zon feet when ultralow volume (ULV) application is made. Do not apply when wind velocity exceeds 15 mph. Avoid applications when wind gusts approach on the cultivate within 10 feet of the aquatic area so as to allow growth of a vegetative filter strip. Do not make aerial or ground applications during term inversions. ****** Do not apply more than 0.5 lbs a,i. per acre per season. ASANA XL is not recommended for control of vegetable leafminer in Florida.

NO FOAM B: This product is formulated from raw materials which will not tend to bum foliage or leave harmful residues. There will be no excessive foa when high pressures are used. Proper quantity to use will vary with water hardness, equipment characteristics, method of application, droplet size, etc. higher rates may be used if recommended by pesticide labeling. Follow pesticide label directions. However, do not add NO FOAM B at a rate which exc 5% of finished spray volume. For concentrate sprays, amounts of NO FOAM B added to total spray is approximately same as with dilute.

Appendix VI Meteorological Data

Monitoring during application of Chlorothalonil and Methamidophos Sept. 2 - 6, 2002

		Wind	Wind	Wind	Ambient	Relative	Barometric	!
Date	Time	Speed	Speed	Direction	Temperature	Humidity	Pressure	Sigma
		(mph)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
alização e semante matricipa de la Constantida del Constantida de la Constantida de la Constantida de la Constantida de la Constantida del Constantida de la Constantida del Constantida de la Constantida del Constantida del Constantida del Constantida del Constantida del Constantida del Constantida d		n 1949 bis increases			Assessment that device the common tentral to	22.0	760 7	50 7
9/1/2002	9:45	the second section of the sect		118.1	29.3	33.8	760.7	59.7
9/1/2002	10:00	化硫甲二酚 化邻苯基苯甲基二甲基苯甲基异	Contract the second second second	300.4	30.7	31.4	at the first out of the control of t	22.5
9/1/2002	to an all many presentations to	en els branco de la Simbo de	2.9	278.8	and the second of the second s	29.4	Course was not be a considered to a	47.9
9/1/2002	10:30	and the state of the same before	4.0	289.2	and the second s	25.3	Committee to the contract of t	29.9
9/1/2002	10:45	La construction of the contract of the contrac	process of the second second second second	experience of the following management of the contract of the	The second of th	Committee of the second of the	tall the control of a proper tracks on the same tracked agreement and agree	23
9/1/2002	gramme and residence from the company of the co-	and the section of the section of the section of	Acres in the second state of the second second second	the whole to the majority filter as the second as before the	Programme was the entire of the contract of th	23.3	process on the color and a this restriction and him date.	28.7
9/1/2002	11:15		disease have been been also a find of the same	294.3	and the second control of the second second	22.6	And the Annual Control of the Contro	22.9
9/1/2002	English sales of sales programs to the best of a	Salah dan Maria da kacamatan da k		296.9	CANADA TO THE SECOND OF A SECTION OF THE SECOND SECO	A CONTRACT OF THE REAL PROPERTY.	A COMPANY OF THE PARK OF THE P	24.4
9/1/2002	11:45		6.4	to the accompany of the plan technique of malification of		22.4	Accessed to the Committee of the Committ	24.1
9/1/2002					And the services of the end dispersion for the service become a committee of		And the state of the second second second second second second	22.9
9/1/2002	12:15	a facility of the same of the contract of				21.2	Annual company of the contract	21.4
9/1/2002	12:30	6.6	5.7			18.5		25.9
9/1/2002	12:45	5.8	5.0	304.2	36.9		the day of the first to the second and the second a	24.7
9/1/2002	13:00	6.3	5.5	282.4	37.3	15.3	760.4	25.7
9/1/2002	13:15	7.2	6.3	277.5	37.7	14.6	760.2	18.6
9/1/2002	13:30	7.8	6.8	286	38	12.9	760	21.8
9/1/2002	13:45	of many of managements	7.2	292.7	38	13.7	759.8	24.8
9/1/2002	de reconstruction processing	THE RESERVE AND PROPERTY AND PARTY.	de la faction de la consultante des la consultante de la consultan	Committee of the committee of the second sec	and a survival de management de la capital d	14	759.7	27.7
9/1/2002	Attack to make a weather the	that may be death a war and	Sandaran dan dan dan dan dan dan dan dan dan d	to Mark the area for the property of the Residence	COLUMN TO THE RESERVE OF THE RESERVE OF THE PARTY OF THE	According to the Control of the Cont	759.6	23.5
9/1/2002	alma ware area an area	AND IN COLUMN THE COURSE OF THE PARTY.		Charles Charles Charles Committee Co		Annual control of the same and the same	MARKET MARKET STATE OF THE PARTY OF THE PART	18.8
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9/1/2002	ala composition are a series to	of a second surface a second	A STATE OF THE REAL PROPERTY AND A STATE OF THE PARTY AND A STATE OF TH		the state of the s	*************	AND THE REAL PROPERTY AND THE PERSON	20.7
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9/1/2002	THE THE PARTY OF THE PARTY AND ADDRESS.	and become the state of the contract of the con-		the of a company to the contract of the contra	AND MAKE THE PROPERTY OF THE PARTY PARTY OF THE PARTY OF	to annihila commercial companies Afficiant to trade of	tion of the second of the seco	18.1
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9/1/2002	and management are a con-	*** *** **** ****	A CONTRACTOR AND A CONT	CONTRACTOR AND ADMINISTRATION OF THE PARTY O	tions have when the embelous of the delay is considered by considering	and a committee when the second contraction of the	ter to the transfer of the forest artists of the contribution of the first of the contribution of the cont	Commence of the part of the commence of the co
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9/1/2002	History white Copperate	market and a will have the constitution	TE COLOR DESIGNATION CO. C. C. C.	THE STREET CONTRACTOR IN THE PROPERTY ASSESSMENT ASSESS	hated also globally than the proper property of the overland to the section of th	taly of the beat of the common little mind between	ter the little of the course, we wise and supplied from the little on the course from the	4.7
STATIONAL CONT. C. STORE MAN LEWIS		A half hit market manager to expect	e con a management and a second	and district the second section in the second section in	way take a marriage trace to the expect considera-	AND A SECURITION OF THE PARTY O	mand, and a subservious transfer and a second of the contract	NAMES OF TAXABLE PARTY OF THE PARTY OF TAXABLE PARTY.
9/1/2002	and the second section in the second	A Charles Committee Control of	and the second of the	water and the state of the same of the same	was accepted to a proper proper of the contract of the contrac	THE REAL PROPERTY AND ADDRESS OF THE PARTY OF	and a company of the contract	5
9/1/2002	distribution by the same of the class of	war in the state of the same of the same	real eres of the exercise sector	Congress of the William P. Roser of the Lorentz of the	control and an incident of the second of the	the control of the second section of the second	化二氯化甲基磺胺甲基 化二二二甲基二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲	The production of the Production Control
9/1/2002	n plant a concentration.	return out out of the base of the		The second secon	and the bound of the state of t		transplant of the second secon	7.7
9/1/2002	The second section is a second second	to a company of the second	the the sign of the sign of	A STATE OF THE PROPERTY AND ADMINISTRAL PROPERTY.	make and the state of the part of the part of the state o	the state of the property of the same of the same	CONTRACTOR AND A SECURITION OF PERSONS ASSESSED.	CONTRACTOR OF STREET
9/1/2002	and the second section in the second	to all the company to be a state of the	the end with 1990al Parage affile	and delete a galler committee and distan-	the side with a recommend of the affiliation of a property and the best condition	and treed in a suject of the second of the s	and a state of the contract of the Boundary and a full partition of the parties	Alter Bissaching bediens die gefahlte der einbeteil er
9/1/2002	and an a record a con-	read our company comes or	PAGE TO THE PROPERTY OF THE PAGE TO THE PA	ran - 4 day on administration -	NAMES AND ADDRESS OF THE OWNER OF THE PARTY OF THE PARTY AND ADDRESS OF THE PARTY ADDRESS OF THE P	THE REAL PROPERTY AND ADDRESS OF THE PARTY O	Complete and the Complete of States and the Complete S	The same discount of the second of the secon
9/1/2002	end a neconstruction	some the production of the co	a character management	Constitution of Contract Contract of the	aparing programme and an absolute representation with the second	the transfer control of the control	and the state of t	The province of the second and the s
9/1/2002	ERRO PERSONAL PROPERTY AND ADMINISTRATION OF THE PARTY ADMINISTRATION OF THE PARTY AND ADMINISTRATION OF THE PARTY AND ADMINISTRATION OF THE PARTY AND ADMINISTRATION OF THE PARTY ADMINISTRATION OF THE PARTY AND ADMINISTRATION OF THE PARTY ADMINISTRATION OF THE PARTY ADMINISTRATION OF THE PARTY AND ADMINISTRATION OF T	Name and Administration of the Control of the Contr	areaft-constituents or silversites	Minor Level, reporter and the super Environment Chicago	The Company of the State of the Company of the Comp		Market and the land of the state of the contract of the state of the s	
9/1/200	NAMED IN ADDRESS OF THE PARTY O	eri 15. julius agentuaren eta 177	or make a management and a con-	er eft i i mindim då Milandim i en e		A Printer of the Contract of t	The real term of the second contract of the s	Annual Control of the
9/1/2003	2 20:3	0 6.	7 5.	8 288.	7 29.	3 29.	6 758.2	5.6

		Wind	Wind	Wind	Ambient	Relative	Barometric	
Date	Time	Speed	Speed	Direction	Temperature	Humidity	Pressure	Sigma
and the second		(mph)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
9/1/2002	20:45	6.4	5.6	286.9	29.1	31.5	758.1	4.8
9/1/2002	21:00	5.4	4.7	281.9	28.1	32.2	758.1	6.2
9/1/2002	21:15	3.3	or a contract the property of	273.3	27.1	32.7		7.4
9/1/2002	21:30	3.3	Annual Control of the	280.5	in ground the first of the second of the second become destination of the	to Associate Address of the State of the Sta	757.9	6.4
9/1/2002	21:45	U 1 1 5 11 - 6 - 60 - 61 11 6 10	Server a specific manufacture	285.7	26.1	33.8	at the contract of the contrac	8.1
9/1/2002	22:00	ALCOHOL: CARACTER STATE		284.6	25.9	LANCE OF THE CONTRACTOR BASELONG COMMITTEE	to restrict the court for a telephone security and the experience of the court of t	5.8
9/1/2002	22:15	3.6		284.9	and the second s	33.8	757.6	5.7
9/1/2002	22:30			261.4	a second at the contract of th	33.8	The second secon	3.1
9/1/2002	22:45	2.7		278.9	25.2	32.6		14.4
9/1/2002	23:00	2.6		299.9	25.1		757.2	3.8
9/1/2002	23:15	2.1	1.8	31.8	A STREET OF PARTIES AS A STREET OF THE PARTIES AND ADDRESS OF THE PARTIES AS A STREET OF THE PARTIES A	the property of the control	The state of the second	46.1
9/1/2002	23:30	3.6		55	parantal of the second and adjust the second and a second adjustment of the second		757.2	8.3
9/1/2002	the man the comment of the second	Constitute to a technique	Contract of the Art State of the confidence of the both	THE REPORT OF THE PARTY OF THE	Class dig be a file in a consistint of the matter than more than the first of the		Commission of the Printing of Section Street Printing Commission Street	10.5
9/1/2002	1		Contract to the second	47.8	22.2		professor for motorstructure consumerable	6.5
9/2/2002	0:15	Land State of the Land of the	Contract the state of the state of the	A CONTRACTOR OF A PROPERTY OF A	20.9		THE WAY THE WORLD THE PROPERTY AND A PROPERTY AND A PROPERTY OF THE PARTY AND A PROPERTY AND A P	6.7
9/2/2002	0:30	the surface of the want of the other	A CONTRACTOR CONTRACTOR CONTRACTOR	39.8	the first the second and the second	that are a second on their particular makes to	Delin di Transportenza de l'Andre de Laboratoria de l'Antonio de Maria de l'Antonio de Maria de l'Antonio de M	4
9/2/2002	0:45		STREET, S. STO. SALESSON STREET, and	32.9	Contract to the Property of the Contract of th		CALLED TRANSPORT CONTRACTOR CONTR	2.5
9/2/2002	di in gantan kanalan kanalan da kanalan da ka	fact and the state of the State	A construct the contract the second state of	31.5	and the second s	Contract of the second state of the second sta	Constants made Programme Apple to Copyright photography argues to the	4.5
9/2/2002	1:15	and the second s		41.7	Control for the control of the contr	A STATE OF THE PARTY OF THE PAR	Parametrican in the control of the second of the second	5
9/2/2002	in character of the manager	.l		24.7	A CALL TO A SECURE OF THE PARTY	Annual Control of the second control of the		7.6
9/2/2002	Contract to the second contract of the second	# 100 C . Walter C	A CONTRACTOR STATE	23.9	Control of the Contro	47.5	Commence of the best statement of the property of the statement of the sta	8.1
9/2/2002	And the second section and the second	al and taken by being the	GA KRIGHT AND STREET	Constitution of the Consti	Committee and the committee of the control of the c	E PROTECTION AND THE PARTY OF THE PARTY OF	Arran Britain in Britain and Secretarists	10.8
9/2/2002	description to the second are only		ALTO SAME AND ADDRESS OF THE PARTY OF	CONTRACTOR	AND ADDRESS OF THE REAL PROPERTY AND ADDRESS OF THE PARTY ADDRESS OF THE	de la secola de la companya del la companya de la c	An arrangement and a second control of the s	6.3
9/2/2002	2:30		and the same of the standard state of the st	35.9		A A A A A A A A A A A A A A A A A A A		7.7
9/2/2002	of a record of the august and a result	ar a a saler e a camera como como como como como como como com	and better wheat west all attended much if	in the state of each state of the state of the black in the state of t	20.4	A calculate a contract and a standard from		5.1
9/2/2002	NAME AND ADDRESS OF THE OWNER, WHEN PARTY AND AD		April and the second of the se	Control to a store of a supplemental production of the	reference to the transfer of the contration and the contration of	· · · · · · · · · · · · · · · · · · ·	The same of the sa	10.1
9/2/2002	A company of the contract of the second			33.3		THE THE PERSON AND ADDRESS OF THE PARTY OF T	and I have been a supplicate to the control of the supplication of	4.3
9/2/2002	was the territor play common takeble.	National and an experience of the second	46 P. 112-1-1-1 T. M. 4-4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Particularly wastern in the bounder to process.	HINE WELL MAY BE THE REAL PROPERTY HAS SELECTED AND AND ADDRESS OF THE SECURITY	the court is seen to be a proper from the court in the co	C ** C ** A A C * A METATO C ** BELLET TO THE CO.	19
9/2/2002	CALLED A SURVEY CONTRACTOR	of special part of a second party	🥰 🙉 e sa esta esta en entre en	125.9	and the same of th	rife is the property of the form the contract the field of the	A Print Walter Color of the Col	57.6
9/2/2002	4:00	the surface of the company of the	arter of the season of the telephone with	Break children (US), Tolki y completon by a c	et - tra commence recovere ecoloris in microbilità de Patronica del Company	adjuly to the control of the second and the second	755.8	24
9/2/2002	indition in the property of the larger process.	elif has entre en inverter de pers	1.0	169.5	18.8	53.8	755.8	13.2
9/2/2002	4:30	1.1	1.0	55.1	18.7	54.4	755.7	29.2
9/2/2002	4:45	3.3	2.9	25.6	19.3	53.5	755.7	5.9
9/2/2002	5:00	1.3	1.1	21.1	18.9	55.6	755.7	16.7
9/2/2002	5:15	5 1	0.9	20.9	17.9	57.9	755.8	16.4
9/2/2002	5:30	1.4	1.2	87.3	17.5	61.6	755.9	49.9
9/2/2002	5:45	3.4	3.0	165.8	17.6	60.9	756	26.4
9/2/2002	6:00	NATIONAL PROPERTY AND ADDRESS.		180.4	18.2	. 58	756	6.7
9/2/2002		printing and property to any or other	and the control of the section of	化类性性 化二氢化二氢化二氢化物 医多种性性 医二氯化物 医二氯化物	and the grand programme and the second of the second the second second second	and the second second second second second second	756	8.4
9/2/2002	6:30	0.7	7 0.6	141.5	18.6	55.3	756.2	27.9
9/2/2002	and the state of the state of	erg service in a new con-	radio e e la maran en es	Miller of the complete of the common flower with the first of the common flower of the common	See that the state of the state	THE RESERVE THE PROPERTY OF THE PARTY OF THE	756.3	35.1
9/2/2002	The second section of the second	CONTRACTOR AND AND A COMMENT OF STREET	The formation of the control between	Marie Marie Carlo	wings on any contest for windows of particle and property and	kan (talah katan kalan lain an antara berbahan katan da da d	rangingerich in die einer der dersten am recepturanten mehren im	43.5
9/2/2002	deline a relative report and they be.	edicina a fairt a contra	me Themes to the country to be a few man of the	Charles and a second of the second of the second of	Principal of the transfer control of althought the	william the application of the second second	756.9	13.1
9/2/2002	7:30	1.5	5 1.3	269.8	23.3	50.9	757.1	31.1
9/2/2002	7:45	5 1.6	3 1.4	241.9	24.6	47.8	757.5	AND ASSESSMENT OF THE PARTY OF
9/2/2002	8:00	2.8	3 2.4	M	displace with the consent of the color to the color to the particles.	37.4		20.7
9/2/2002	8:15	5 3.4	4 3.0	327.4	27.6	34.9	758.1	25

9			Wind	Wind	Ambient	Relative	Barometric	
Date	Time	A STATE OF STREET	Speed	Direction	The selection of the County is a constitution to the property of the selection of the selec	Humidity	Pressure	Sigma
and in Company of the section of the Section S		(mph)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
9/2/2002	8:30	2.2	1.9	305.2	28.5	35.2	758.3	51
9/2/2002	8:45	3.3	2.9	322.5	29.5	33.3	part of the company o	37.3
9/2/2002	9:00	5.5		333	30.5	30.5	the second contract the se	21
9/2/2002	9:15	6.4		297.7	and the state of the second or the second	27.2	Contract the Contract Account with the contract of	18
9/2/2002	9:30	8.1		311.2	and the second s	22.3	A CONTRACT OF SIZE CONTRACTOR AND SIZE OF SIZE	15.8
9/2/2002	9:45	8.7	i i commissionere	307.9	32.5	21.7	the address of the companion of the property of the companion of the compa	18.3
9/2/2002	10:00	8.1	A city of the beautiful and the second of th	305.8	Secure and the state of the sta	22	and additionable on the appropriate or stores. The sa	15.3
9/2/2002	10:15	5.9	Access a commence property	303	33.3			22.1
9/2/2002	10:30			312.2	33.9			26.9
9/2/2002	10:45	6.4	of contract of course a sealth Mile on the	The Street Control of the Street Control of Street	rykala, manga ang panggapanggit an manggapan manih. Pik alipi kapan manag senara is	Carried and a single and the state of the st	But were a fine the will dispose at the field procedure to the con-	24.4
9/2/2002	11:00	contract of the Management of the Contract of	N THE STREET OF STREET	Control of the second control of the second of	e a caracter de la companya de la co		P. LEWIS CO., Co., Co., Co., Co., Co., Co., Co., Co	22.9
9/2/2002	11:15	6.2	of a fact that we will produce to	343.6	Committee of the Commit	and the committee of the second contract the first of the second	like a gran a na arigina ar anyo ka wa antara ga targata isang ga a	33.3
9/2/2002	11:30	to the thirtman continues a sta	alan disease and bearing the second	351.2	g dielb wille nichte in der Sie ein die bereite der der in der die der Geschneideren	e, and common the contribution of the second of the contribution o	Militaria anglesa - Park a 11 majangahada dapat na ababban	29
9/2/2002	11:45	6.6	The second commence with	341.5	people and a common traction is an experience and com-	As well as the second s	of a minor removation to a compression of the	30.2
9/2/2002	12:00	6.7	ALL RESIDENCE OF A PROPERTY.	312.8		er an er	Garage and the same and a second second to be a second as	27.1
9/2/2002	12:15	A	· State of the space of the space of the space of	grant the discommended and analysis for	Maria Constitution Control of Constitution (Constitution Constitution	Contract of the Administration of the	Market Street Committee and the Committee of the Committe	23.8
9/2/2002	12:30	for a comment of the contract of	-1 market community of the state of	Contract the second color and the second color	CA DOMESTIC OF THE STATE OF THE	The second section and the second second section is		24.3
9/2/2002	12:45	É de la completation estat de maries minutes		de la companya del companya de la companya del companya de la comp	Acres persons and are recognized in the control of	Large of a fraction of the section of the section of the section of	there are relative and an argument of a day to the area and a	23.1
9/2/2002	13:00	Contract of the Contract of th	and a realistic cities a new branch and Links		of the similarium desires, been alterbased with the property of the contract o	and were a transfer of a contraction of the state of the	and the safe and the both both deep and parameters Helf-el	22.2
9/2/2002	13:15				THE RESERVE OF THE PERSON OF T		and or a market or the first of the second or the second o	20
9/2/2002	13:30	Committee to be comed a reflect fragment		326	· · · · · · · · · · · · · · · · · · ·	13.2	A STATE OF THE PARTY OF THE PAR	24.5
9/2/2002	13:45	Carry Street Carry Street or Street and	Burn auf Park and an addressed out Park All	A 27.5.07 A 64 C 647 2 A 448 A 57.5.1.16 A 10	APPROXIMATE OF SIZE OF BUILDING APPROXIMATION OF THE PARTY OF THE PART		the contract of the contract o	20
9/2/2002	14:00	er irri aamidi mint ii	ed to a train by chimageness	for a sign of the same and the second	A COLUMN TO THE REAL PROPERTY OF THE PARTY O	deserve expense on the property of	with the state of the same of	22.1
9/2/2002	14:15	Contraction of the streets and the com-	and the second of the following of the second	of a security of the second of the particle of the first second of the s	and a stand and all the reason are at the entire force of the standard property of the depth of the standard o	and was recovered a control forwards from control and the cont		26.7
9/2/2002	14:13	eli in mari imborato antiintraasse	er finalen næntstønet plænt træmer b	ali esta e si un biologica de establica de la constanta de la	the solver's fire speciments of the Essitte System Speciment and make Atlantic			25.2
9/2/2002	14:45	No. of the Contract of Commences of	and the second section is the second second	A CHICAGO CONTRACTOR C	AND THE RESERVE THE PROPERTY OF THE PROPERTY OF THE PARTY	A THE RESERVE AS A STREET OF THE PROPERTY OF THE PARTY OF	the first contract the same and the same of the same o	24.6
9/2/2002	15:00	of common an arrangement and the	and the second of the second of the second	eli, aprili inacconsissioni un lui metanimini		and the street of A is organized to the section of	1. 200°, 1. 1200, 1. 2000, 1. 2000, 1. 20° 1	24.1
9/2/2002	15:15	MANAGEMENT OF ALL COMMITTEE	Management and the second second	is a wastenbelow on Prophylodenbelokalisals	the following and the first taken with the major that are street to be	professional comment agriculture consideration de la consideration	HIL HARRY AND MAN, ON A RIPPORT NAME AND PARTY HARRISTS.	22.5
9/2/2002	15:30	VA CHEROLOGICAL COMMENTS	and the second service	Name and Address of the Owner, or other Party of the Owner, where the Owner, which is the Owner, which	The state of the s	and the second of the second o	and the second course of the second commence of the	32.2
9/2/2002	15:45	of the state when a second	racifica e esperato e propa propara de la	ele en manifestation de manuel de la faction de la factio	and a commence of the second control of the second of the second of	reference for which there is mandemarkets	Barrier and St. Co. (B. B.) Committee Block Conservations of the Printers of	17.5
9/2/2002	Land or of the transmitted	A STATE OF THE PARTY OF THE PAR	The section of the section of the	White Manager and the state of	The contract of the Partition College Wheelver and the Partition College Colle	No	Minjahallandi. Bar a said har tan tantaga Mana-Adding Haradania.	22.9
9/2/2002			5.2					23.4
9/2/2002	de la compania de la	and the same of th	ACID CONCERNOUS CONCESSIONS	and the state of t	an and the color of the party of the color of the state o	months and a symmetry make a second but	ومان والمستعملة بالمحدد والمحدث بالمدين والمان والمتبار	17.8
9/2/2002	Carried the Atlantance of the State of the S	CALLED AND SOMEWARD MATERIAL STREET	Marie America, rose or grane a mere	No ANNALOUS OF STREETH OF STATE	y any distribute only a selection of the second state of the second seco	nama (nama ang taon nama na taon na kabalang kabalan na kabalan na kabalan na kabalan na kabalan na kabalan na	patra di Mandalla, califica e de la calación, de la compaña de la constitución de la compaña de la compaña de c	14.7
9/2/2002	and the second second second second second	With the Control of Control of Control	and the second section of the second	AND THE RESERVE AND THE PARTY OF THE PARTY O	ent for the set of the contract of the contrac	and commenced the first recommendation	and the first of the same and the same same services.	15.8
9/2/2002	And in the books and	CAMPAGNA A CONTRACTOR	transference and a statement of	· · · · · · · · · · · · · · · · · · ·	taraf, como a grança e cola como mora escaba de la calenda de escab	Charles and the second of the contract of the	adija dia	10.9
9/2/2002	Acres and the second second	the tracks that addition when	databague i commit mattacatal	a tile of the Tail of the Name of the Mills than of	estile a testape in a historia beneficiar as and ten 160 Million (1806).	options during man destinates the	one halida allebaire dot the of a way-sentimentary	1. forestable of a block between the
9/2/2002			there is no second to the terms of	and have the forest parameter than the parameter of		and the same of th	and the second s	CASE
9/2/2002		agent out programmed to provide the	4 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	N TO A CALL THE WAY MAY BE AND HOLD	THE REPORT OF THE PARTY OF THE	and the state of the second transport to the state of	enforcement in the contract of	ATT THE RESERVE OF THE PROPERTY OF THE PROPERT
9/2/2002	above which brooks by the	at the contract in the day to the day	and the continuous for the season of the	SHOPA CONTRACT TO A STATE OF THE PARTY OF	Carrier and the contract of the second of the Andrews of the Second		and the interest of the Arthur Personal Section Control of Section (1)	San and the same of a substitute of
9/2/2002	dancameron en	and the second	and the first section and a second section of the second	THERE IS A SECOND OF THE PROPERTY OF	and produced the contract of additional and the following products are pro-	and the same of th	A CO. T. C. C. CO. CO. C.	distribution of the second section of the second
9/2/2002	HE CONTRACTOR	Paristance - sic . 1 sim ha - 10	property and in one condition to a security of the ex-	english alternative transcentratement was present	transfer i getave e tamp a la fette i ne grapha a la factate compréssion de l'actoriste (a també).	este dia transcriptor e botteta personalement	and the contract of the second section of the contract sections and the second sections are sections as the second sections and the second sections are sections as the second section	and the contract of the fift without the destable.
9/2/2002	ng ay best the strates on the send	and to define the state of the second	ability on Palpin workshipserporters.	eta e e e e e Parigitalité tambémba	kydyk i monthi i handa impolek po vodi 2001 i traffi. ombor	a fayer to the introduction the property	THE WALLEST AND THE PARTY OF TH	Kada toy data mastrook interests to the contract
9/2/2002				40 pa 40	and and the second control of the second con			
9/2/2002	what removes a record	e mail and the second second second second	and the second of the boundary the	Contract to the second section of the second	THE RESERVE THE THE PARTY OF TH	manes of the market management in the contract additions will add	And the second section of the second	contraction in the property contribution parameter
and the state of the second of	artika a mara da	property of the second	8 7.0	CONTRACTOR CONTRACTOR CONTRACTOR	and the second second second second second	MARKET AND POST OF STREET, STR	والمتلفة والمناطقة والمنطقة المناطقة والمناطقة والمناطة والمناطقة	CONTRACTOR OF THE PARTY AND ADDRESS OF THE PAR
9/2/2002								

		Wind	Wind	Wind	Ambient		Barometric	:
Date	Time	Speed	Speed	Direction	Temperature	Humidity	Pressure	Sigma
The second section of the section of	control to season of	(mph)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
9/2/2002	20:15	5.7	5.0	266.4	29.5	24.7	755.9	4.3
9/2/2002		5.7	terral communications	271.4	28.8	and the second of the regular agency of the con-	and the state of t	5.3
9/2/2002	20:45	7.1	per la cere de la companya del companya del companya de la company	279.1	28.1	a and the course of the electric people is good office.	and the second of the second o	7.3
9/2/2002	21:00	6.1	5.3	276.9	and an order of the contract of the second section of the second section of	27.1	have been been as a company of the c	8.2
9/2/2002	21:15	4.9	i e anno entre a companio	283.7	27.4	per la prima de la companya del companya de la companya del companya de la compan	755.8	8.6
9/2/2002	21:30	4		260.5	26.8	26.1	755.8	10.9
9/2/2002	21:45	7.6	gara to your above more transfer	262	Control from the Control of the Cont	The second of th	Company of the property of the contract of the	7.7
9/2/2002	and the second second second second	7.6		264.5	26.4	and the second s	and the second control of the second control	6.4
9/2/2002	22:15	6	re and the said and probability of the re-	274.6	A decision of the second secon	26.6	The state of the s	8.1
9/2/2002	22:30	4.5	and a first county basis or before Mily back	308.1	25.7	26.8	The state of the second of the state of the	18.1
9/2/2002	22:45	5.3	Mary Carlot Assessment Control of Address Marie	37.2	Control of the second of the s	30.6	Land and the second a	20.1
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9/3/2002	3:45	3.8	3.3	345.4	19.4	45.8	753.9	11.1
9/3/2002	4:00	4.6	4.0	331.1	19.6	46.2	753.8	11.3
9/3/2002	4:15	1.6	1.4	316.8	19.2	48.6	753.9	24.7
9/3/2002	4:30	1.9	1.7	249.5	18.3	51.1	754	24.9
9/3/2002	4:45	4.3	3.7	231.9	18.1	50.8	754.1	15.1
9/3/2002	5:00	2.9	2.5	236.7	17.9	50.9	754.1	7.3
9/3/2002	5:15	2.9	2.5	229.8	17.6	51.5		28.6
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9/4/2002 9:30 5.2 4.5 267.9 26.1 22.2 759.2 11 9/4/2002 19:45 6.2 5.4 256.2 25.9 24.5 759.3 \$ 9/4/2002 10:00 8.5 7.4 267.5 26.4 23.2 759.4 16 9/4/2002 10:15 6 5.2 289.6 26.9 20.1 759.4 15 9/4/2002 10:30 7 6.1 287.7 27.2 15.9 759.4 12 9/4/2002 10:45 7.1 6.2 291.4 27.3 17.4 759.4 14 9/4/2002 11:00 5.3 4.6 30.8 28.2 19.8 759.5 22 9/4/2002 11:05 6.5 5.7 287.8 29.6 18.2 759.5 22 9/4/2002 11:30 6.5 5.7 287.8 29.6 18.2 759.5 31 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:00 5.8 5.0 27.9 29.2 18.7 759.8 19 9/4/2002 12:00 5.8 5.0 27.9 29.2 18.7 759.8 19 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 72 9/4/2002 12:45 3.2 6.1 36.9 30.5 19.5 759.6 33 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 33 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 33 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 34 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 34 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 34 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 44 9/4/2002 13:45 7.9 6.9 30.5 5.2 18.3 759.5 22 9/4/2002 14:30 8.1 7.0 266.8 32 18.4 759.4 33 9/4/2002 14:30 8.7 0.2 266.8 32 18.4 759.4 33 9/4/2002 14:35 6.5 5.7 287.8 32.6 18.3 759.5 22 9/4/2002 14:45 6.5 5.7 287.8 32.6 18.3 759.5 22 9/4/2002 15:50 7.7 6.7 271.1 32.8 19.2 759.2 34 9/4/2002 15:45 10.1 8.8 293.3 31.7 17.6 759.2 34 9/4/2002 15:45 10.1 8.8 293.3 31.7 17.9 759.6 19 9/4/2002 15:45 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 15:45 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:15 10.1 8.8 293.3 31.7 17.2 758.9 11 9/4/2002 16:30 11.8 10.3 297.4 31.1 16.4 759.1 11 9/4/2002 16:30 11.8 10.3 297.9 276.2 26.6 759.1 1 9/4/2002 16:30 11.8 10.3 297.9 276.	9/4/2002	9:00	4.7	4.1	296.4	24.8	26.7	758.7	34.5
9/4/2002 9:45 6.2 5.4 256.2 25.9 24.5 759.3 5 9/4/2002 10:00 8.5 7.4 267.5 26.4 23.2 759.4 16 9/4/2002 10:15 6 5.2 289.6 26.9 20.1 759.4 16 9/4/2002 10:30 7 6.1 287.7 27.2 15.9 759.4 12 9/4/2002 10:45 7.1 6.2 291.4 27.3 17.4 759.4 14 9/4/2002 11:00 5.3 4.6 30.4 27.3 21.1 759.5 20 9/4/2002 11:15 5.3 4.6 30.8 28.2 19.8 759.5 22 9/4/2002 11:15 5.3 4.6 30.8 28.2 19.8 759.5 22 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 89.1 29.5 20.1 759.7 72 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 72 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 72 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 33 9/4/2002 13:45 6.7 5.8 26.4 23.1 1.5 15.7 759.6 34 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 36 9/4/2002 13:45 6.5 5.9 5.1 5.7 31.2 17.9 759.6 34 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 34 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 34 9/4/2002 13:30 8.1 5.9 5.1 5.7 31.2 17.9 759.6 44 9/4/2002 13:30 8.1 5.9 5.1 5.7 31.2 17.9 759.6 44 9/4/2002 13:30 8.1 5.9 5.1 5.7 31.2 17.9 759.6 44 9/4/2002 13:30 8.1 5.9 26.8 32 18.4 759.4 3 9/4/2002 14:40 8.1 7.0 266.8 32 18.4 759.4 3 9/4/2002 14:30 8.7 0.266.8 32 18.4 759.4 3 9/4/2002 14:35 6.5 5.7 299.4 32.7 18.7 759.2 2 9/4/2002 15:30 8.6 7.5 293.2 32.7 18.4 759.2 2 9/4/2002 15:30 8.6 7.5 293.2 32.7 18.4 759. 1 9/4/2002 15:30 8.6 7.5 293.2 32.7 18.4 759. 1 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 759 11 9/4/2002 15:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 15:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.9 759.1 1 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:45 10.1 8.	9/4/2002	9:15	5.1	4.4	280.8	26.1	22	759.1	23.3
9/4/2002 10:00 8.5 7.4 267.5 26.4 23.2 759.4 16 9/4/2002 10:15 6 5.2 289.6 26.9 20.1 759.4 15 9/4/2002 10:30 7 6.1 287.7 27.2 17.5 759.4 15 9/4/2002 10:45 7.1 6.2 291.4 27.3 17.4 759.4 14 9/4/2002 11:00 5.3 4.6 30.4 27.3 21.1 759.5 20 9/4/2002 11:15 5.3 4.6 30.8 28.2 19.8 759.5 20 9/4/2002 11:35 6.5 5.7 287.8 29.8 16.9 759.5 31 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 15 9/4/2002 12:45 3.5 3.0 256.6 29 21.9 759.6 33 9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 33 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 33 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 33 9/4/2002 13:30 3.7 3.2 76.5 30.7 20.2 759.6 34 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 44 9/4/2002 13:35 5.9 5.1 5.7 31.2 17.9 759.6 34 9/4/2002 13:35 5.9 5.1 5.7 31.2 17.9 759.6 34 9/4/2002 14:30 8.1 7.0 266.8 32 18.4 759.4 33 9/4/2002 14:30 8.7 7.0 266.8 32 18.4 759.4 33 9/4/2002 14:30 8.7 7.0 284.6 32.4 18.2 759.2 9/4/2002 15:30 8.7 7.0 284.6 32.4 18.2 759.2 9/4/2002 15:30 8.7 7.9 6.9 305.5 32 18.3 759.5 29 9/4/2002 14:30 8.7 7.0 286.8 32 18.4 759.4 33 9/4/2002 15:00 7.7 6.7 271.1 32.8 19.2 759.2 9/4/2002 15:30 8.7 7.9 287.8 32.6 18.3 759.1 22 9/4/2002 15:30 8.7 7.9 287.8 32.6 18.3 759.1 22 9/4/2002 15:30 8.6 7.5 299.4 32.7 18.7 759.3 22 9/4/2002 15:30 8.6 7.5 299.4 32.7 18.7 759.2 29 9/4/2002 15:30 8.6 7.5 299.4 32.7 18.7 759.2 29 9/4/2002 15:30 8.6 7.5 299.4 32.7 18.7 759.2 29 9/4/2002 15:30 8.6 7.5 299.4 32.7 18.7 759.1 29 9/4/2002 16:00 9.9 8.6 275.2 31.8 18.3 759.1 19 9/4/2002 16:00 1.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:00 1.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 16:00 1.1 9.7 366.8 293 11.7 16.4 759 11 9/4/2002 16:00 11.2 9.7 366.8 295 16.9 759.1 11 9/4/2002 16:00 19.9 8.6 275.2 31.8 18.3 759.1 11 9/4/2002 16:00 19.9 8.6 275.2 31.8 18.3 759.1 11 9/4/2002 16:00 9.9 8.6 275.2 31.8 18.3 759.1 11 9/4/2002 16:00 19.9 8.6 275.2 31.8 18.3 759.1 11 9/4/2002 16:00 10.2 9.7 366.8 295.5 16.9 759.1 11 9/4/2002 16:00 9.9 8.6 275.2 26.7 59.1 11 9/4/2002 16:00 9.9	9/4/2002	9:30	5.2	4.5	267.9	26.1	22.2	759.2	11.7
9/4/2002 10:15 6 5.2 289.6 26.9 20.1 759.4 15 9/4/2002 10:30 7 6.1 287.7 27.2 15.9 759.4 12 9/4/2002 10:45 7.1 6.2 291.4 27.3 17.4 759.4 12 9/4/2002 11:00 5.3 4.6 304 27.3 21.1 759.5 22 9/4/2002 11:15 5.3 4.6 300.8 28.2 19.8 759.5 22 9/4/2002 11:30 6.5 5.7 287.8 29.6 18.2 759.5 22 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 19 9/4/2002 12:03 3.5 3.0 256.6 29 21.9 759.8 22 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 36 9/4/2002 13:35 5.9 5.1 5.7 31.2 17.9 759.6 36 9/4/2002 13:35 5.9 5.1 5.7 31.2 17.9 759.6 44 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 4 9/4/2002 14:45 6 5.2 307.5 32.1 17.6 759.3 3 9/4/2002 14:45 6 5.5 7.9 284.6 32.4 18.2 759.4 3 9/4/2002 14:45 6 5.5 5.7 287.8 32.6 18.3 759.4 3 9/4/2002 15:45 6.5 5.7 287.8 32.6 18.3 759.4 3 9/4/2002 15:45 6.5 5.7 287.8 32.6 18.3 759.4 3 9/4/2002 15:45 3.2 6.9 30.5 5 32 18.3 759.5 4 9/4/2002 15:45 5.9 5.1 5.7 31.2 17.9 759.6 44 9/4/2002 15:45 7.9 6.9 305.5 32 18.3 759.5 3 9/4/2002 15:45 6.5 5.7 287.8 32.6 18.3 759.4 3 9/4/2002 14:45 6 5.5 5.7 287.8 32.6 18.3 759.1 2 9/4/2002 14:45 6.5 5.7 287.8 32.6 18.3 759.1 2 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 7.5 759.2 2 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 75.9 759.6 11 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 75.9 759.1 19 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 75.9 759.1 19 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759.1 19 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759.1 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759.1 11 9/4/2002 16:45 11.6 10.1 299.7 275.3 22.3 28.1 20.4 759.1 11 9/4/2002 16:45 11.6 10.1 299.7 20.2 20.2 20.4 759.1 11 9/4/2002 16:45 11.6 10.1 299.7 20.2 20.2 20.2 20.2 20.2 20.2	9/4/2002	9:45	6.2	5.4	256.2	25.9	24.5	759.3	9.4
9/4/2002 10:30 7 6.1 287.7 27.2 15.9 759.4 12 9/4/2002 10:45 7.1 6.2 291.4 27.3 17.4 759.5 26 9/4/2002 11:00 5.3 4.6 304 27.3 21.1 759.5 26 9/4/2002 11:15 5.3 4.6 300.8 28.2 19.8 759.5 22 9/4/2002 11:30 6.5 5.7 287.8 29.6 18.2 759.5 31 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 39.4 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 19 9/4/2002 12:05 5.8 5.0 279 29.2 18.7 759.8 29 9/4/2002 12:05 3.5 3.0 256.6 29 21.9 759.8 22 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 12:45 3. 2.6 136.9 30.5 19.5 759.6 33 9/4/2002 13:05 3.7 3.2 76.5 30.7 20.2 759.6 33 9/4/2002 13:35 5.9 5.1 5.7 31.2 17.9 759.6 34 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 44 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 23 9/4/2002 14:15 6 5.2 307.5 32.1 17.6 759.3 39 9/4/2002 14:45 6.5 5.7 287.8 32.6 18.3 759.5 23 9/4/2002 14:45 6.5 5.7 287.8 32.1 17.6 759.3 33 9/4/2002 14:45 6.5 5.7 287.8 32.6 18.3 759.1 29 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 759.1 29 9/4/2002 15:45 11.2 9.7 275.3 32.3 19.1 759 11 9/4/2002 15:00 7.7 6.7 271.1 32.8 19.2 759.2 29 9/4/2002 15:00 7.7 6.7 271.1 32.8 19.2 759.2 29 9/4/2002 15:00 7.7 6.7 271.1 32.8 19.2 759.2 29 9/4/2002 15:00 8.6 7.5 293.2 32.7 18.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:45 11.6 10.1 299.3 30.3 16.4 759 11 9/4/2002 16:01 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 17:15 9.7 8.4 312.3 28.7 18.7 759 21 9/4/2002 16:05 10.1 8.8 293 31.7 17.2 758.9 11 9/4/2002 17:15 9.7 8.4 312.3 28.1 20.4 759.1 19 9/4/2002 16:05 11.6 6.5 5.7 299.4 32.1 17.6 759.2 11 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.6 6.5 5.7 299.4 32.7 18.7 759.1 1. 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.8 10.3 297.4 31.1 16.4 759 11 9/4/2002 16:05 11.6 6.5 5.7 299.4 20.2 52.6 759.1 19 9/4/2002 16:05 11.6 6.4 287.3 25.9 24.8 759.1 19 9/4/2002 17:30 7.4 6.4 318.3 25.7 62	9/4/2002	10:00	8.5	7.4	267.5	26.4	23.2	759.4	16.3
9/4/2002 10:45 7.1 6.2 291.4 27.3 17.4 759.4 14 9/4/2002 11:00 5.3 4.6 304 27.3 21.1 759.5 22 9/4/2002 11:15 5.3 4.6 300.8 28.2 19.8 759.5 22 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 22 9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 33 9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 68 9/4/2002 13:45 7.9 6.9 30.5 31.2 17.9 759.6 42 9/4/2002 13:45 7.9<	9/4/2002	10:15	6	5.2	289.6	26.9	20.1	759.4	15.3
9/4/2002 11:00 5.3 4.6 304 27.3 21.1 759.5 20 9/4/2002 11:15 5.3 4.6 300.8 28.2 19.8 759.5 22 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 22 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 15 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 63 9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 64 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:45 7.9<	9/4/2002	10:30	7	6.1	287.7	27.2	15.9	759.4	12.4
9/4/2002 11:15 5.3 4.6 300.8 28.2 19.8 759.5 22 9/4/2002 11:30 6.5 5.7 287.8 29.6 18.2 759.5 31 9/4/2002 12:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 12 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 13:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 13:30 6.1 5.7 31.2 17.9 759.6 65 9/4/2002 13:30 6.1 5.7 31.2 17.9 759.6 66 9/4/2002 13:30 6.1 5.7 31.2 17.9 759.6 42 9/4/2002 13:35 7.9 6.9 305.5 32	9/4/2002	10:45	7.1	6.2	291.4	27.3	17.4	759.4	14.9
9/4/2002 11:30 6.5 5.7 287.8 29.6 18.2 759.5 31 9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:15 3.5 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 289.1 29.5 20.1 759.7 77 9/4/2002 12:35 3.5 3.0 89.1 29.5 20.1 759.6 75 9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 66 9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 66 9/4/2002 13:15 5.9 5.1 5.7 31.2 17.9 759.6 42 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 22 9/4/2002 14:00 8.1<	9/4/2002	11:00	5.3	4.6	304	27.3	21.1	759.5	20.7
9/4/2002 11:45 6.7 5.8 297.8 29.8 16.9 759.7 20 9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 22 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 66 9/4/2002 13:15 5.9 5.1 5.7 31.2 17.9 759.6 42 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:345 7.9 6.9 305.5 32 18.3 759.5 32 9/4/2002 14:15 6 5.2 307.5 32.1 17.6 759.3 33 9/4/2002 14:45 6.5 </td <td>9/4/2002</td> <td>11:15</td> <td>5.3</td> <td>4.6</td> <td>300.8</td> <td>28.2</td> <td>19.8</td> <td>759.5</td> <td>22.5</td>	9/4/2002	11:15	5.3	4.6	300.8	28.2	19.8	759.5	22.5
9/4/2002 12:00 5.8 5.0 279 29.2 18.7 759.8 15 9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 22 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 13:30 3.7 3.2 6.5 30.7 20.2 759.6 33 9/4/2002 13:15 5.9 5.1 5.7 31.2 17.9 759.6 44 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 22 9/4/2002 14:00 8.1 7.0 266.8 32.1 17.6 759.3 3 9/4/2002 14:15 6 5.2 307.5 32.1 17.6 759.3 3 9/4/2002 14:30 8	9/4/2002	11:30	6.5	5.7	287.8	29.6	18.2	759.5	31.5
9/4/2002 12:15 3.5 3.0 256.6 29 21.9 759.8 22 9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 13:05 3 2.6 136.9 30.5 19.5 759.6 65 9/4/2002 13:05 3.7 3.2 76.5 30.7 20.2 759.6 65 9/4/2002 13:15 5.9 5.1 5.7 31.2 759.6 42 9/4/2002 13:35 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 26 9/4/2002 14:00 8.1 7.0 266.8 32 18.4 759.4 32 9/4/2002 14:30 8 7.0 284.6 32.1 17.6 759.3 32 9/4/2002 15:00 7.7 6.7	9/4/2002	11:45	6.7	5.8	297.8	29.8	16.9	759.7	20.2
9/4/2002 12:30 3.5 3.0 89.1 29.5 20.1 759.7 74 9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 33 9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 66 9/4/2002 13:15 5.9 5.1 5.7 31.2 17.9 759.6 42 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:345 7.9 6.9 305.5 32 18.3 759.5 22 9/4/2002 14:00 8.1 7.0 266.8 32 18.4 759.4 32 9/4/2002 14:30 8 7.0 284.6 32.4 18.2 759.2 9/4/2002 15:00 7.7 6.7 271.1 32.8 19.2 759 2 9/4/2002 15:30 8.6 7.5 <td>9/4/2002</td> <td>12:00</td> <td>5.8</td> <td>5.0</td> <td>279</td> <td>29.2</td> <td>18.7</td> <td>759.8</td> <td>19.5</td>	9/4/2002	12:00	5.8	5.0	279	29.2	18.7	759.8	19.5
9/4/2002 12:45 3 2.6 136.9 30.5 19.5 759.6 33 9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 68 9/4/2002 13:15 5.9 5.1 5.7 31.2 17.9 759.6 42 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 29 9/4/2002 14:00 8.1 7.0 266.8 32 18.4 759.4 32 9/4/2002 14:15 6 5.2 307.5 32.1 17.6 759.3 32 9/4/2002 14:45 6.5 5.7 287.8 32.6 18.3 759.1 2 9/4/2002 15:15 6.5 5.7 287.8 32.6 18.3 759.1 2 9/4/2002 15:15 6.5 <td>9/4/2002</td> <td>12:15</td> <td>3.5</td> <td>3.0</td> <td>256.6</td> <td>29</td> <td>21.9</td> <td>759.8</td> <td>22.8</td>	9/4/2002	12:15	3.5	3.0	256.6	29	21.9	759.8	22.8
9/4/2002 13:00 3.7 3.2 76.5 30.7 20.2 759.6 66 9/4/2002 13:15 5.9 5.1 5.7 31.2 17.9 759.6 42 9/4/2002 13:30 6.1 5.3 264.2 31.5 18.5 759.6 42 9/4/2002 13:45 7.9 6.9 305.5 32 18.3 759.5 29 9/4/2002 14:00 8.1 7.0 266.8 32 18.4 759.4 32 9/4/2002 14:30 8 7.0 284.6 32.4 18.2 759.2 9/4/2002 14:45 6.5 5.7 287.8 32.6 18.3 759.1 2 9/4/2002 15:00 7.7 6.7 271.1 32.8 19.2 759 2 9/4/2002 15:15 6.5 5.7 299.4 32.7 18.7 759 2 9/4/2002 15:30 8.6 7.5	9/4/2002	12:30	3.5	3.0	89.1	29.5	20.1	759.7	74.1
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The supplied of the supplied o	and the second for the first for the property of the property	contracts removed to		reference a service consequence	the contract of the second second	graduation group of transport to be the authority of the property of the court	Der Bergeren gereinen gereine ber ber ber ber ber ber ber ber ber be	and comments of a new contract of the second	13.1
			Commence of the Commence of th	THE STATE OF THE PROPERTY.	AND LAKES FROM SOME COMPANIES THAT I WHEN	CONTRACTOR OF PROPERTY OF THE PARTY OF THE P	DESCRIPTION OF THE PROPERTY AND ADMINISTRATION OF THE	Bright I visit is being the being the being	
Contraction and the contraction of the contraction	Committee of the second	mineral and and and an income	reg to be or the come of the		APPENDING TO A STATE OF THE PARTY OF THE PAR	AND THE ROOM OF TAXABLE IN HISTORY OF THE RESIDENCE	AND AND RESIDENCE AND ADDRESS OF THE RESIDENCE AND ADDRESS.	angligie name i la company de la company	11.5 11.4

		Wind	Wind	Wind	Ambient		Barometric	
Date	Time	Speed	in all managements	Direction	Temperature	Humidity	Pressure	Sigma
The second section of the sect		(mph)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
9/4/2002	19:15	17.3	15.0	263.6	23	15	758.9	9.3
9/4/2002	19:30	13.5	11.7	273.9	22.6	16.7	758.8	12.5
9/4/2002	19:45	11.7	10.2	286.1	22.5	18.7	758.8	12.5
9/4/2002	20:00	13.4	11.7	274.7	22.3	19.2	758.8	9.8
9/4/2002	20:15	16.9	14.7	278.6	21.8	20.3	and the second of the second o	10.1
9/4/2002	20:30	12.7	11.0	284.8	20.8	A CONTRACT CONTRACTOR OF	because a processor with the second and the second	10.9
9/4/2002	20:45	10.3	9.0	285.4	20.2	28.1	758.9	10.7
9/4/2002	21:00		9.8	284.7	19.7	31.3	758.8	10.6
9/4/2002	21:15	9.7	for the second problem where the	300.8	19.5		figures in a section of the construction with a security figure of a con-	12.8
9/4/2002	21:30	7.5	Commence and the second second	309.6	19.2	Automorphism in the Secretary of the Control of the	francisco com a construit en la construit en l	15.4
9/4/2002	21:45	10.4	9.0	283.4	18.9	37.1	758.8	15.5
9/4/2002	22:00	11.8	10.3	286.5	And the second s	40.3	758.8	12.8
9/4/2002	22:15	11.2	Or	287.8	the action of the same and acceptable and the	43.2	758.7	11.4
9/4/2002	22:30	8.2	Contra Branchic and Branchic Street	303	17.9	45.1	758.6	12.4
9/4/2002	22:45	7.4	6.4	303.8	17.7	46.2	758.6	11.7
9/4/2002	23:00	5.7	5.0	300.4	17.5	47.7	758.6	15.5
9/4/2002	23:15	7	6.1	288.6	17.5	45.6	758.6	10.2
9/4/2002	23:30	8.1	7.0	296.2	17.4	47.7	758.6	13
9/4/2002	23:45	13.1	11.4	277.3	17.3	49.9	758.6	9.6
9/4/2002	1	13.8	12.0	275.5	17	53.2	758.5	9.6
9/5/2002	0:15	12.4	10.8	to the series of		54.6	758.5	11.7
9/5/2002	0:30	to a see - water the earth	the compact conditions of the proper particular	of the company of the	And the second section of the second section is the second section of the section o	to contract their name with a significant forms	COLLEGE AND THE PROPERTY OF PROPERTY OF THE PARTY OF THE	8.9
9/5/2002	0:45	13.2	11.5	269.5	16.4	55.8	758.6	8.7
9/5/2002	1:00	12.3	10.7	266.1	16.2	56.6	758.7	8.5
9/5/2002	1:15	10.7	9.3	266.7	16	57	758.7	8.7
9/5/2002	1:30	10.7	9.3	264.7	15.8	57.8	758.8	8.4
9/5/2002	1:45	11.7	10.2	263.1	15.8	57.9	758.8	8.1
9/5/2002	2:00	10.6	9.2	262.2	15.8	57.5	758.9	8.6
9/5/2002	2:15	10.3	9.0	da	at the same of the same and same and the sam	57.9	758.9	8.1
9/5/2002	2:30	10	8.7	261.3	15.7	58.2	758.8	8.5
9/5/2002	2:45				15.6	58.3	758.8	7.3
9/5/2002	in the Commission of the Co	A Proposition of the Contract	A STANSON AND A STANSON STREET, BUTTON		15.5	59.6	758.8	6.7
9/5/2002	NAME OF ROOMS ASSESSED AND PROPERTY.	A CONTRACT OF STREET	make a ser to the manager of the	Here types to be believe A part of the large brigation.	15.4	e për a malayet i Ngapara ka majaka kashirin aktir kitika kiti dhe	negy principal and the artificial interest and a second of the best of the contract of the con	8.6
9/5/2002	Street Street Street Street Street	de la companya della companya de la companya della	ere and a mark territor	262.8	15.1	62	ARREST CONTRACTOR OF THE PROPERTY AND ADDRESS OF THE PARTY ADDRES	7.4
9/5/2002	Continue to the second	of common the end of the			and proceedings to the contract to the contract of the contract process of the contract of the		and water a part is a second or the construction and the stage	7.9
9/5/2002	Name of Property Spirit and Company	decrease to a serious expension and their		nt various and although the transcript	any new more with a father of the autophile between the later.	files on a name I am to Palastichto files	and a second contract of the c	7.5
9/5/2002		*** *** ****** *** *	**	· ·	the same desired to the same and states and section and the same and t	AND THE SECTION OF THE RESIDENCE		9.1
9/5/2002	piece and a contraction	pays the property of the second	The first of the second	" or 100 miles a 411-feed	and the second of the second o	and the real territory was recommended.	and the contract of the contract of the contract of	8.5
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9/5/2002	and a first transfer of the part of the color of the best of	of a constant of the control of	engle a company agreement management	official and the control of the between the same	and a contract of the contract	erio) i communicati communicati com communicati con	and the second of the second o	10
9/5/2002	all a breat area was a second	with the second service and the Parity of the second	who are not as the present the second	and the contract of the contra	talli provincia in la segui transcribe dell'estra di l'accesso i l'accesso di l'accesso di l'accesso di l'accesso di	PRESENTE AND ADMINISTRATION OF THE PROPERTY AND ADMINISTRATION AND ADM	and the fact of the second	8.9
9/5/2002	ALL AND DOMESTIC OF A PRICE OF	reference to a complete per	drawing or top a law political district	PER Transition distance and and admin	eras, en como como a constitucione del establica de la companio del companio de la companio de la companio del companio de la companio del la companio del la companio de la companio del la companio de la companio de la companio de la companio del la companio de	man make make and a mineral distribution the places about,	and the first of the contract	11
9/5/2002	and a commence of the commence			Name and Administration of the Park of the		era beneva anno governo de como persona estado	REAL PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PARTY AND	7.5
9/5/2002		# 1915		and in the property of the same	Semple the Administrative Comments and the	Conference of the second second	many representative and proper hardware desperant and personal for states	9.2
9/5/2002	STATE OF TARREST AND BASE	of the second second	the state of the s	Tell a transmission of the second sec	the first him a condition to the second and the same of the best of the second and the same of the sam	magician and the world with the contract management and	College of the Park to the Board of the Company of the Park of the	long to be TV Annual to the SEE STATE OF THE SEC STATE OF THE SEE STATE OF THE SEC STATE OF
9/5/2002	a fator a war than a confidence.			made at the second section of the second	men and the same a	mand to the state of the state	and the comment of the state of	group to the large to a specific and the large
9/5/2002	6:45	10.3	9.0	258.2	16.2	59.6	759.6	9.1

D-4-		Wind	Wind	Wind	Ambient		Barometric	Ciama
Date	Time		Speed	Direction	and a supplemental transfer for the supplemental expension of the first	a second contract to the second contract of	Pressure	Sigma
Consider and Arthouse approximations, while considering	ora oscar serverana	(mpn)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
9/5/2002	7:00	10.2	8.9	254.8	16.8	58.7	759.7	10.9
9/5/2002	7:15	10.1	8.8	255.9	17.3	56.6	759.9	9.6
9/5/2002	7:30	10.6	9.2	252.9	17.9	54.3	760.1	9.6
9/5/2002	7:45	10.3	an extension of the actions?	254.9	18.5	52.4	760.2	10.6
9/5/2002	8:00	9.5	8.3	258.6	19.1	47.9	The state of the s	12.4
9/5/2002	8:15	9.6	8.3	250.0	19.7		760.7	10.8
9/5/2002	8:30	9.0	and the second s	271.9	and the state of t	41.3	760.8	13.1
9/5/2002	8:45	and the formation of the second of	9.4	273.4	20.9	37.8	e a comprehensi a presidenti a presidenti di constitui di	15
9/5/2002	9:00	10.3	A SAN CONTRACTOR OF THE PARTY	259.1	21.1	39.2	Contract of the Authority with material and an	15.4
9/5/2002	9:15	10.2	a Comme de la completation de la companya del companya de la companya de la companya del companya de la company	263.3	21.4	37.2	A STATE OF THE PARTY OF THE PAR	11
9/5/2002	9:30	Annual Commence of the second second	9.7	265.4	21.7	36.8	761.1	16.5
9/5/2002	9:45	Committee of the state of the s		264.6	22.3	36	761.1	15.1
9/5/2002	tableton a series off the markets of			279.3	Contain the market when it is a fifth an existence of the and	32.9	Marie and the extension of the St. Marie Attended to the court of	12.1
9/5/2002		A	in a management of the second of	275.4	23.2		761.1	14.7
9/5/2002	10:15 10:30	ATT THE OWNER OF THE PARTY AND ADDRESS OF THE	10.2	273.4	23.3	30.9	761.1	13.9
9/5/2002		to the contract of the contract of	9.6	266.7	23.8	a the second of the second second control	The state of the second section in the second	11.9
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9/5/2002	11:00	day you don't be the state of participation or		292.8	A ser consequence of the contraction of the contrac	and a second of the Author and Author the State of the St	Contract the second of the contract of the second of the s	19.1
9/5/2002	11:15	Government Community of the State of St	Indicate had come a great house.	288.7	Opini Silay Collegia, moje billioni in territori in maliti i mendidi mendelika erre problemi in ber	22.5	A STATE OF THE PROPERTY OF THE PARTY OF THE	Annual Comment of the public process and an ampropriet of
9/5/2002	11:30			277.7	Annual Control of the	22.8	And the same particular and the same and the	20.2
9/5/2002	11:45	distance of the second second second second		283.4	A CONTRACTOR OF THE PROPERTY O	23.3		17.6
9/5/2002	er et benommet a moteration en en e	Nigeria, p. 1974 hits Man purper."		282.5	No. 11-10 Property and Property and National Property of	the server of the service of the server of the	distribution also actions for the NEW YEAR SHOPE SHOPE IN	26
9/5/2002	12:15	nice and the second second second		THE R. P. LEWIS S. R. BANKS, MICH. S. BERT PROPERTY.	A THE CORPORATE TO A PERSON OF THE PROPERTY OF	Annual residence of the same o	and the second section is a second section of the second section of the second section is a second section of the section of the section of the second section of the section of t	22.2
9/5/2002	alestado asemberas cares de ser	of a - 2 and 2 22 borner		302.4	A comment of the state of the s	والمراجع والم والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراج	all accommendation commendences and interest Principles and the second re-	20
9/5/2002	Code to an extended to the last before the				A commence of the second secon	Adia anno a Million in la mais Ballibatha Milliona	the contract enterestable to be seened.	47.2
9/5/2002	almost correct transmit		A SUBSECULAR STATE OF SUBSECULAR STATE OF	251.3	The same of the sa	Van Branch in the second trademan return to the	all representation of the second of the seco	45.1
9/5/2002			Name of the Original Assessment was	5			na grande ar not gang ago, aray , a years pear before property and the	52
9/5/2002	Historian cutationin makes to	Maria bases established a setablished	and the second second second second	Annual Williams Administration by Security 2		A CHEST STREET, / Lock Complete Street, Application of the Complete Street, and Complete	PARTIES AND	74.4
9/5/2002	Anna	diamental and a second	the season of the second second	340	A CONTRACTOR OF THE PROPERTY O	the same and the same and the fact that the same and the same that the s		47.4
9/5/2002	and a company that the company to the company of		Higgs a die oppositioner gewone beginn	13.1	A MANAGEMENT OF THE RESIDENCE OF THE STATE O		article for the control of the contr	66.8
9/5/2002								53.8
9/5/2002	to the second of the party of t			A THE COLUMN TWO IS NOT THE OWNER, WHEN THE PARTY OF THE	the second secon			65.7
9/5/2002	The same of the sa	the Control of the Co		CASH TATAL OF THE PERSON ASSESSMENT				31.1
9/5/2002	righted reserve areas a second	mija ti sama santawanian sa	ALEXANDER CONTRACTOR	A work and a superior and the state of t	CONTRACTOR OF THE PARTY OF THE PROPERTY OF THE PARTY OF T	ters manifes to the foreign to shall be the commence of the state of	AND THE RESIDENCE OF STREET, S	THE RESERVE OF A PARTY OF THE PARTY OF THE PARTY.
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9/5/2002	addressing or a respective and deposit	and the common transportation	PERSON I BOOKED INCOME BUREAUST	era er yez a difere yez er gang a yez gang bere digital iyeli yezhoù da d'ar	reclaiment in the commence that it is not been an included a standard process.	reference to the second	má kar szemekettéken er a varálakkannak kaladá	production of beginning the state of the second state of the secon
9/5/2002	nila a carrette e e e e e e e e e e e e e e e e e	reng . To a transfer for more comments	almen an arrangament pe	d'a pare a traval de la representation de la compa	Maria Maria Salara C. S	Contract to the second	and or a substitute of the second of the sec	79.3
9/5/2002	China Contractor of the	Charles of a company to the same of	and the second remaining the second	the state of the control of the property of the	NAME OF THE PARTY	metrophysical and a section of the section of the contract of	radio in the part of the company was a second	26.7
9/5/2002	CONTRACTOR OF THE PARTY	and a comment of the state of the	HER POWER SHAPE A SOLE ARM	Secretaria de la compansión de la compan	and a process of the second se	erin antiki miranta a reard Asar na ramishir	in all and the conditions of the first territories with a compared of the	The Property States of Contract Contrac
9/5/2002	and the survey was the same of	and a commence		e i i i i i i i i i i i i i i i i i i i	and the committee of the particular contraction of the contraction of	and real contract of the contr		12.7
9/5/2002	The contract of the contract o		andre was a series and a series of the	And a Minimum world Property and an	the company of the contract of	and included a second of Addition on the		17.4
9/5/2002	17:15	7.6	6.6	attended to the set of material Address of the	because the properties and the bottom between	a Commentence to March 1987 to a septembra to the Comment	make the state of the commence and probability at the manage property of the	anne a constitution property and a standard between the conficulty
9/5/2002	radices company assesses	COLUMN TO SERVICE STATE OF THE PARTY OF THE	7.0	AND ADDRESS OF THE REAL PROPERTY AND ADDRESS.	CONTRACTOR OF PARTY AND ADDRESS OF PARTY AND ADDRESS OF THE PARTY ADDRESS OF THE PARTY ADDRESS OF THE PARTY AND ADDRESS O			TI MATE MINISTER MELAPORT A PROPERTY AND ASSESSMENT OF THE PERSON OF THE
9/5/2002	17:45	5 9.′	and or an experience are recovered	the entropy of the second section with the time of the entropy of			COLUMN TO A COLUMN TO THE PART OF THE PROPERTY OF THE PARTY OF THE PAR	grant and College are a grant by British had 150 and a sec-
9/5/2002	18:00	10.3	9.0	296.9	25.2	24.	759.4	11.3
9/5/2002	18:15	5 8.6	7.5	302.5	5 24.5	26.9		
9/5/2002	18:30	8.9	7.4	300.5	23.5	30.	759.2	11.6

:	;	Wind	Wind	Wind	Ambient	Relative	Barometric	:
Date	Time	Speed	Speed	Direction	Temperature	Humidity	Pressure	Sigma
and the course or which the control of	ra car district dell'improvenzione del	(mph)	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
9/5/2002	18:45	8.1	7.0	290.7	22.7	34.5	759	10.8
9/5/2002	19:00	11	9.6	293.1	22	38.6	the contract of the contract o	10.7
9/5/2002	19:15	9.4	8.2	290.9	21.4	41.3	CONTRACTOR OF THE PROPERTY OF THE REAL PROPERTY OF THE REAL PROPERTY OF THE PR	10.5
9/5/2002	19:30	8.3	7.2	293.9	20.7	44.1	A THE RESIDENCE AND A LONG THE PROPERTY OF THE PARTY OF T	12.4
9/5/2002	19:45	the state of the s	6.8	289.7	a comment and the same and the	47.1	The suppression of the same of	12.2
9/5/2002	20:00	7.6	6.6	281.2	19.8	er did to the comment of the same of the comment of	ingen er en	9.8
9/5/2002	20:15	9.2	8.0	269.9	and a reason of the present present parties of the content of the parties of the	when the control that had a manufacture manufacture.	Constitution of Contract of Contract of the State of Contract of C	9.6
9/5/2002	20:30	11.6	10.1	274.4	the barrier of the state of the	50.4	Secret Company of the	9.4
9/5/2002	20:45	11.7	10.2	270	18.9	and the first with the first design and the first of the	Control of the Contro	9.2
9/5/2002	21:00	haranta aran makaban menerakan da	9.5	267.8	18.5	AND THE RESERVE AND ADDRESS OF THE PARTY.		9
9/5/2002	21:15	11.6	and the second comments	262.7	18.1	55.9	and the second s	9.3
9/5/2002	21:30	10.5		261.5				8.6
9/5/2002	21:45		STATE OF THE PARTY	267.5				11.3
9/5/2002	22:00	7.8	Contract to the second beautiful to the second beautif	257.3	17.5			10.4
9/5/2002	22:15	10.3	former on the contract the second	261.5	17.1		Constitution of the set are an electrical and the second section of the second section of the second	9.7
9/5/2002	22:30	and the first state over 17 minutes	provided artists of the second of	Literations on the rate adjust and party agency of	spekings . http://www.se.sept.com/sectors/sectors/	Land to the state of the state	Compart or Carlored Arts of Partie 44	8.6
9/5/2002	22:45	11.7	Annual of the section and the commence	263.6	and the second second the second seco	and the same with a bing processor or the same from	A ALEXANDER OF THE PROPERTY OF	9,4
9/5/2002	23:00	12.9	Martin a marter and a series and a series	263.4	Comments and the comment of the contract physics and complete the	Colonial and the second of the second colonial and an expension of the second colonial and the second	and the second of the second of the second s	9.1
9/5/2002	23:15	and the second s	10.4	261.1	16.7	Adventage to the state of the security of the second	ay ay and a state management and an extension of the state of the stat	9.1
9/5/2002	23:30	L	9.0		16.5	THE RESIDENCE OF THE PARTY OF T	Acres with the street of the second party of the second of	9
9/5/2002	23:45	7	i a a marine commensario	273.9	THE RESERVE THE PERSON NAMED TO ADMINISTRATION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT OF THE PERSON NAMED IN COLUMN TWO IS NAMED IN CO	the sale of the Laborator with the property of the party of the laborator	An annual territories and an annual section of the second section of the section of the second section of the	13.9
9/5/2002	1	8.2	7.1	276.7	Charles About TROMA Trained A STATE TO THE STATE OF THE ACCUMULATION AS A STATE OF THE ACCUMU	CONTRACTOR OF THE PROPERTY OF THE PARTY OF T	757.5	14.4
9/6/2002	0:15	7.8	6.8	272.5	16.2	63.9	757.5	12.8
9/6/2002	0:30	7.4	6.4	268.2	16	64.9	757.4	11.8
9/6/2002	0:45	7	6.1	266.9	15.6	66.5	757.4	10.6
9/6/2002	1:00		5.7	274.9	15.5	67.2	757.4	10.9
9/6/2002	1:15	4.9	4.3	283.5	15.4	67.3	757.5	17.5
9/6/2002	1:30	7	6.1	265.6	15.1	68.2	757.4	12.4
9/6/2002	1:45	5.9	5.1	259.7	15	68.5	757.3	11
9/6/2002	2:00	6.4	5.6	262.9	14.9	68.7	757.3	10.5
9/6/2002	2:15	8	7.0	257	14.8	68.7	757.3	9.6
9/6/2002	ed de cotence d'erder décarament de d'act	5.8	5.0	256.1	14.8	68.7	757.3	11.1
9/6/2002	di operacioni in the consistent in	decadement	Comment mount on the comment of the	Paratricular territoria in the second of the Company of the Compan	alica canada por carpa para ta esta esta en espera de la carecta de la c	PROPERTY OF A PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE P	red concentration in a few construction of the second decidence of the second decidence of the second in the second decidence of the second decidence	7
9/6/2002	Witness and the state of the same of the	d	A	of the late of the same of the same of the same of the	PERSONAL PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PERSON OF THE P		A 1991 Manage State of the Control o	7.9
9/6/2002	Secretary with the second	the artists are a second as the second			Capacitation and the Capacitation are an experience between the control party.	date with the special properties of the	when where the district of the property with proper maps	11.7
9/6/2002		of a married and animates at the material			reference to a superior to a force of the state of the st			11.2
9/6/2002	A CONTRACTOR OF A STREET	to a committee of the second of the second of the			and the second section of the	Name and Address of the Parket	and there are the transfer and transfer and the property of the	12.8
9/6/2002		production and approximate acceptance of			and the man company of the contract of the company of the contract of the cont	and the against the contract of the first of the boson	they are the contracts on the entire contracted contrac	13.8
9/6/2002	of a control book to the	director and the company of the second	HE was transferred to the second section of the	The many and increased the fall than being amounted.	Committee and a proper property of the committee of the c	15号 : 计回答信息 \$P\$ 15 图 15 中心 6 15 15 1915 11 11 11 11 11 11 11 11 11 11 11 11 1	化氯化二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基	9
9/6/2002	and the second contract of the second	hali att a aga ang ang katalan at a sa ta	ma to a direct har had a grant of	the committee of a special contribution with a special and	Committee of the commit	after the state of	andre construit on the contract of the contrac	8.7
9/6/2002	rifi od i aredatinoproparioni	there is a real partie of the second continue	afiltoni	Promise advisores de tentigo for a refore paparet, passet.	at for the construction of	had, in a tradicial redigion rates including amount medicing who	and for the contract the second court of the second contract contract of the second contrac	16.7
9/6/2002	after a keitelytelande, by alle word	hely with a superior at the contribution		Philippin in the factor of the control of the contr	The service of the se		and you district over the first in the property of the first his	12
9/6/2002				article and a second contract of the second c	the second second section between the way and the second sections and the second sections and the second sections are second sections as the second section se	OR COLUMN THE PROPERTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PART	A THE RESERVE AND A STREET OF THE PARTY OF T	11.8
9/6/2002		My to the contract of the second	my or a market to the commence of		agigan par mayor and a garder of the contract		and the state of t	14.6
9/6/2002		Military or come or properly department of the	i, big	the the process of the same of the same of the same	the contraction of the contracti	STREET, STREET	met and a distance was not all the annual beauties where	10
9/6/2002			and the second second	THE R. P. LEWIS CO., LANSING MICH. LANSING MICH.	and the same of th	Anglish control a product company with the	per a caracter de la caracter de la companya del companya de la companya del companya de la comp	8.8
9/6/2002	6:15	8.1	7.0	260.2	14.4	71.5	757.5	6.9

	Data	Time	Wind	Wind	Wind	Ambient Temperature		Barometric Pressure	Sigma
	Date	Time	a and the second	(knots)	(Deg)	(Deg C)	(%)	(mmHg)	(Deg)
	9/6/2002	6:30	8.8	7.7	257.8	14.5	71.6	757.6	8.6
, e	9/6/2002	6:45		8.3	254.5	14.9	70.5	757.7	9.3
	9/6/2002		Lancia de Lacia de La Lacia de	4	250.7	15	69.6	757.9	11.7
to wellbod.	9/6/2002	7:15	8.6	7.5	253.7	15	70.3	758	11.8
	9/6/2002	7:30	ga 	8.6	254.4	15.7	68.8	758	12.2
Same and	9/6/2002	7:45	9.8	8.5	252.5	16.7	66.2	758	13.2

Appendix VII Chlorothalonil Field Log Sheets

Project: Chlorothalonil Application Air Monitoring in San Joaquin County Project #: P-02-002 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

#		Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
	Name	ID	On	On	On	On	Flow		K,P,C,F&R	
		Number	Off	Off	Off	Off	9.2%		On	Off
001	S-C-B-FS	MC-3	09/02/02	0647	309.70	2.98	3.00	FIELD SPIKE	K	AC
001	0.0.0-1.0	1010 0	09/03/02	0600	332.90	3.00	3.02		K	AC
002	S-C-B	MC-4	09/02/02	0647	309.70	2.98	3.00		K	AC
002	0-0-5	WIO-4	09/03/02	0600	332.90	2.97	2.99		K	AC .
003	W-C-B-FS	MQ-3	09/02/02	0701	116.20	2.98	3.00	FIELD SPIKE	K	AC
000	***************************************	,,,Q O	09/03/02	0621	139.50	2.99	3.01	<u> </u>	K	AC
004	W-C-B	MQ-4	09/02/02	0701	116.20	2.98	3.00	<u>}</u>	K	AC
004		11100 -	09/03/02	0621	139.50	2.99	3.01		K	AC
005	N-C-B-FS	MV-3	09/02/02	0720	613.80	2.98	3.00	FIELD SPIKE	К	AC
	11-0-0-1-0		09/03/02	0639	637.10	3.00	3.02		K	AC
006	N-C-B	MV-4	09/02/02	0720	613.80	2.98	3.00		K	AC
	11-0-5	10,0 4	09/03/02	0639	637.10	3.00	3.02		K	AC
007	E-C-B-FS	MN-3	09/02/02	0748	441.30	2.98	3.00	FIELD SPIKE	K	AC
007	E-0-b-1 0	10114-0	09/03/02	0700	464.50	2.98	3.00		K	AC
008	E-C-B	MN-4	09/02/02	0748	441.30	2.98	3.00		K	AC
000	,E-C-B	10114-4	09/03/02	0700	464.50	3.00	3.02		K	AC
009	E-C-B-TS	N/A	09/02/02	2000	N/A	N/A		TRIP SPIKE	K	AC
009	E-C-B-13	N/A	N/A	N/A	N/A	N/A	#######		N/A	N/A
010	S-C-1	MR-4	09/03/02	0854	344.60	2.98		START OF APPILCATION 920 PST	K	AC
010	3-0-1	1011/-4	09/03/02	1124	347.10	2.88	2.90		K	AC
011	SW-C-1	MC-4	09/03/02	0900	332.90	2.98	3.00		K	AC
011	300-0-1	IVIC-4	09/03/02	1133	335.50	2.88	2.90		K	AC
012	W-C-1	MO-4	09/03/02	0907	244.50	2.98	3.00		K	AC
012	AA-C-1	1010-4	09/03/02	1140	247.10	2.87	2.89		K	AC
042	NW-C-1	MQ-4	09/03/02	0907	139.50	2.98	3.00		K	AC
013	NVV-C-1	1VI CQ-44	09/03/02	1147	142.20	2.92	2.94		K	AC
044	N-C-1	MX-4	09/03/02	0909	258.20	2.98	3.00		Κ	AC
014	14-0-1	101.5-4	09/03/02	1153	260.90	2.96	2.98		K	AC
015	NE-C-1	MV-4	09/03/02	0913	637.10	2.98	3.00		K	AC .
015	NE-C-1	101 V - 4	09/03/02	1159	639.80	2.71	2.73		К	AC
010	E C 4	MALA	09/03/02	0916	464.50	2.98	3.00		K	AC ·
016	E-C-1	MN-4	09/03/02	1208	467.30	2.91	2.93		K	AC
242	F 0 4 0	140.4	09/03/02	0916	339.00	2.98	3.00		K	AC
017	E-C-1-C	MA-4	09/03/02	1207	341.80	2.90	2.92		K	AC
242	05.04	8410/ 4	09/03/02	0920	123.20	2.98	3.00		K	AC
018	SE-C-1	MW-4	09/03/02	1220	126.20	2.91	2.93	· . j	K	AC

MFM Used #: 5063 Slope: 0.9978 Intercept: 0.0308

1 of 6

Project: Chlorothalonil Application Air Monitoring in San Joaquin County Project #: P-02-002 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
#	Name	ID	On	On	On	On	Flow		K,P,C,F&R	On
		Number	Off	Off	Off	Off			On Off	Off
019	S-C-2	MR-4	09/03/02	1125	347.10	2.98	3.00	END OF APPLICATION 1115 PST	K	AC
019	3-0-2	WIN-4	09/03/02	1232	348.20	3.14	3.16	<u>l'annual de la companyant de la company</u>	K	JW
020	SW-C-2	MC-4	09/03/02	1135	335.50	2.98	3.00		K	JW
020	377-0-2	1910-4	09/03/02	1241	336.60	3.00	3.02		K	JW
021	W-C-2	MO-4	09/03/02	1142	247.10	2.98	3.00		K	JW
021	VV-C-2	1010-4	09/03/02	1250	248.20	3.00	3.02		K	JW
022	NW-C-2	MQ-4	09/03/02	1148	142.20	2.98	3.00		K	JW
022	NVV-U-2	1VIQ-4	09/03/02	1257	143.40	2.94	2.96		K	JW
202	NOO	NAV 4	09/03/02	1153	260.90	2.98	3.00		K	JW
023	N-C-2	MX-4	09/03/02	1305	262.10	3.00	3.02		K	JW
201	NE O O	10/4	09/03/02	1200	639.90	2.98	3.00		К	JW
024	NE-C-2	MV-4	09/03/02	1310	641.00	2.81	2.83	· ·	K	JW
	F 0 0	1411	09/03/02	1213	467.40	2.98	3.00		K	JW
025	E-C-2	MN-4	09/03/02	1319	468.50	2.95	2.97		K	JW
200	5000	144	09/03/02	1213	341.90	2.98	3.00		K	JW
026	E-C-2-C	MA-4	09/03/02	1322	343.00	2.98	3.00		K	JW
227	SE-C-2	MW-4	09/03/02	1221	126.20	2.98	3.00		K	JW
027	SE-C-2	10100-4	09/03/02	1330	127.30	3.00	3.02		K	JW
028	S-C-3	MR-4	09/03/02	1234	348.20	2.98	3.00		K	JW
020	3-0-3	10117-4	09/03/02	1436	350.20	2.91	2.93		K	JW
029	SW-C-3	MC-4	09/03/02	1243	336.60	2.98	3.00		K	JW
029	344-0-3	MC-4	09/03/02	1444	338.60	2.98	3.00	¥ 1	K	JW
030	W-C-3	MO-4	09/03/02	1251	248.30	2.98	3.00	,	K	JW
030	VV-C-3	100-4	09/03/02	1451	250.20	2.98	3.00		K	JW
031	NW-C-3	MQ-4	09/03/02	1259	143.40	2.98	3.00		K	JW
031	NVV-C-3	10102-4	09/03/02	1457	145.40	2.92	2.94		K	JW
022	N-C-3	MX-4	09/03/02	1306	262.10	2.98	3.00	:	K	JW
032	N-C-3	1017-4	09/03/02	1504	264.10	2.98	3.00		K	JW
000	NE C 2	141/4	09/03/02	1313	641.10	2.98	3.00		K	JW
033	NE-C-3	MV-4	09/03/02	1510	643.10	2.96	2.98		K	JW
224	500	AANLA	09/03/02	1323	468.60	2.98	3.00	. • •	K	JW
034	E-C-3	MN-4	09/03/02	1518	470.50	3.00	3.02		K	JW
	5000	140.4	09/03/02	1325	343.10	2.98	3.00		K	JW
035	E-C-3-C	MA-4	09/03/02	1523	345.10	3.00	3.02		K	JW
		1001	09/03/02	1332	127.40	2.98	3.00		K	JW
036	SE-C-3	MW-4	09/03/02	1530	129.30	2.99	3.01		K	JW
	Millord #:	5063	Slone	0.9978	Intercent:	0.0308	بالمسيمسين			أسسينسس

MFM Used #: 5063 Slope: 0.9978 Intercept: 0.0308

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Project: Chlorothalonil Application Air Monitoring in San Joaquin County Project #: P-02-002 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
#	Name	۵l	On	On	On	On	Flow		K,P,C,F&R	On
100 3 3 40		Number	Off	Off	Off	Off			Off	Off
007	S-C-4	MR-4	09/03/02	1436	350.30	2.98	3.00	,	K	JW
037	5-0-4	IVITY-4	09/03/02	1723	353.00	3.00	3.02		K	JW
200	014/014	110.4	09/03/02	1444	338.60	2.98	3.00		K	JW
038	SW-C-4	MC-4	09/03/02	1732	341.40	3.00	3.02	7	K	JW
	N4.0.4	110.4	09/03/02	1452	250.30	2.98	3.00		K	JW
039	W-C-4	MO-4	09/03/02	1740	253.10	2.98	3.00	1	K	JW
240	NIM C 4	140.4	09/03/02	1459	145.40	2.98	3.00		K	JW
040	NW-C-4	MQ-4	09/03/02	1748	148.20	3.04	3.06	1	K	JW
044	N.C.4	MX-4	09/03/02	1506	264.10	2.98	3.00		K	JW
041	N-C-4	IVIA-4	09/03/02	1756	266.90	2.95	2.97		K	JW
240	NE O 4	14/4	09/03/02	1512	643.10	2.98	3.00		K	JW
042	NE-C-4	MV-4	09/03/02	1803	645.90	2.99	3.01		K	JW
240	F 0.4	1411	09/03/02	1519	470.60	2.98	3.00	,	К	JW
043	E-C-4	MN-4	09/03/02	1812	473.40	3.04	3.06		K	JW .
244	5040	140.4	09/03/02	1524	345.10	2.98	3.00		K	JW
044	E-C-4-C	MA-4	09/03/02	1817	348.00	3.00	3.02	·	K	JW
045	SE-C-4	MW-4	09/03/02	1531	129.40	2.98	3.00		K	JW
045	SE-U-4	10100-4	09/03/02	1824	132.20	2.97	2.99	·	К	JW
046	S-C-5	MR-4	09/03/02	1725	353.10	2.98	3.00	·	K	JW
046	3-0-5	IVITY-4:	09/04/02	0635	366.20	3.00	3.02		K	AC
047	SW-C-5	MC-4	09/03/02	1734	341.40	2.98	3.00		K	JW
047			09/04/02	0652	354.70	3.10	3.12		. K	AC
048	W-C-5	MO-4	09/03/02	1742	253.10	2.98	3.00		K	JW
			09/04/02	0704	266.50	3.05	3.07		K	AC JW
049	NW-C-5	MQ-4	09/03/02	1749	148.20	2.98 3.00	3.00	 	K	AC
			09/04/02 09/03/02	0714 1758	161.60 267.00	2.98	3.02		K	JW
050	N-C-5	MX-4	09/03/02	0721	280.30	2.94	2.96		K	AC
			09/03/02	1804	645.90	2.98	3.00		K	JW
051	NE-C-5	MV-4	09/04/02	0730	659.40	3.03	3.05		K	AC
			09/03/02	1814	473.50	2.98		LOW BAT	K	JW
052	E-C-5	MN-4	09/04/02	0740	485.60	2.10	2.13	ſ	K	AC
			09/03/02	1818	348.00	2.98	3.00		K	JW
053	E-C-5-C	MA-4	09/04/02	0747	361.40	3.05	3.07	ľ	K	AC
	05.05	101/	09/03/02	1825	132.30	2.98	3.00		K	JW
054	SE-C-5	MW-4	09/04/02	0757	145.80	3.00	3.02	[К	AC
	Tillood #	E063	Slope	0.9978	Intercent:	0.0308				

Project: Chlorothalonil Application Air Monitoring in San Joaquin County Project #: P-02-002 On Flow: 3.00 <u>+</u>0.02lpm Off Flow: 3.00 lpm <u>+</u>10%

1.00	Sample	Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
Log #	Name	ID	On	On	On	On	Flow		K,P,C,F&R	
π 14: 3-	Adilo	Number	Off	Off	Off	Off	100		On Off	
e de casa de la compansión de la compans			09/04/02	0520	N/A	N/A	#######	TRIP SPIKE	K	AC
055	S-C-6-TS-1	N/A	N/A	N/A	N/A	N/A	#######		К	N/A
			09/04/02	0520	N/A	N/A		TRIP SPIKE	K	AC
056	S-C-6-TS-2	N/A	N/A	N/A	N/A	N/A	#######		K	N/A
	. !	 	09/04/02	0520	N/A	N/A		TRIP SPIKE	K	AC
057	S-C-6-TS-3	N/A	N/A	N/A	N/A	N/A	#######		K	N/A
		1	09/04/02	0530	N/A	N/A		TRIP BLANK	K	AC
058	S-C-6-TB	N/A	N/A	N/A	N/A	N/A	#######		K	N/A
		1	09/04/02	0637	366.20	2.98	3.00		K	AC
059	S-C-6	MR-4	09/04/02	1727	377.10	2.83	2.85		K	JW
		1	09/04/02	0654	354.80	2.98	3.00		K	JW
060	SW-C-6	MC-4	09/04/02	1738	365.50	2.93	2.95		K	
		1	09/04/02	0707 .	266.50	2.98	3.00		K	AC
061	W-C-6	MO-4	09/04/02	1754	277.30	2.88	2.90		K	JW
		1	09/04/02	0715	161.60	2.98	1	BAD BATTERY #19 NO FLOW	K	AC
062	NW-C-6	MQ-4	09/04/02	1803	171.70	0.00	0.03		K	JW AC
		MY	09/04/02	0724	280.40	2.98	3.00		K	JW
063	N-C-6	MX-4	09/04/02	1811	291.10	2.87	2.89		K	AC
	NE C 6	MV-4	09/04/02	0732	659.40	2.98	3.00		K	JW
064	NE-C-6	1010-4	09/04/02	1819	670.20	2.85	2.87		K	AC
225	E-C-6	MN-4	09/04/02	0742	486.00	2.98	3.00		K	JW
065	E-U-0	10114-4	09/04/02	1828	496.70	2.87	2.89		K	AC
000	E-C-6-C	MA-4	09/04/02	0750	361.50	2.98	3.00		l R	JW
066	E-0-0-0	IVIA-4	09/04/02	1834	372.20	2.82	2.84		K	AC
067	SE-C-6	MW-4	09/04/02	0759	145.80	2.98	3.00		K	JW
067	3E-0-0	10100-4	09/04/02	1843	156.50	2.90	2.92	DEAD BATTERY	K	AC
068	S-C-7	MR-4	09/04/02	1730	377.10	2.98	3.00 0.03	DEAD BATTER!	ĸ	JW
000	0-0-7	IVIIX	09/05/02	0643	389.00	0.00 2.98		BATTERY LOW	K	AC
069	SW-C-7	MC-4	09/04/02	1741	365.50		2.11	DATTENT LOVV	K	JW
009	377-0-7	1410 1	09/05/02	0653	377.50	2.08		BATTERY LOW	ĸ	AC
070	W-C-7	MO-4	09/04/02	1758	277.30	2.98	3.00 0.78	IDATIENT 60VV	K	JW
0,0	V V - O - 1		09/05/02	0702	287.20	0.75		BATTERY LOW	ĸ	AC
071	NW-C-7	MQ-4	09/04/02	1806	171.70	2.98	0.23	DATIENT COTT	K	JW
0/1	1444-0-1	191546 7	09/05/02	0709	182.30	0.20		BATTERY DEAD	ĸ	AC
072	N-C-7	MX-4	09/04/02	1814	291.20	2.98	3.00	DATIENT DEAD	K	JW
0/2	N-0-1	IVIX-4	09/05/02	0716 0.9978	299.10 Intercept:	0.00	0.03			

Project: Chlorothalonil Application Air Monitoring in San Joaquin County Project #: P-02-002 On Flow: 3.00 <u>+</u>0.02lpm Off Flow: 3.00 lpm <u>+</u>10%

Log	Sample	Sampler	Date	Time	On Flow: 3.	Flow On	True Flow	Comments	Weather K,P,C,F&R	Initials On
#	Name	ID [On	On	On		1 1000		On Off	Off
		Number	Off	Off	Off	Off	2.00	BATTERY DEAD	К	JW
		10/4	09/04/02	1823	670.20	2.98		BATTERTOLAD	К	AC
073	NE-C-7	MV-4	09/05/02	0725	681.60	0.00	0.03	BATTERYLOW	K	JW
			09/04/02	1832	496.80	2.98	0.00	BATTERT LOV	K	AC
074	E-C-7	MN-4	09/05/02	0734	508.90	1.65	1.68		K	JW
			09/04/02	1838	372.20	2.98	3.00	d	K	AC
075	E-C-7-C	MA-4	09/05/02	0742	385.30	2.90	2.92	In a TERM DEAD	K	JW
			09/04/02	1847	156.60	2.98		BATTERY DEAD	K	AC
076	SE-C-7	MW-4	09/05/02	0750	168.80	0.00	0.03	BATTERY DEAD AERIEL SPRAYING IN FIELD	K	AC
			09/05/02	0645	389.00	2.98	3.00	1300' DUE WEST 0636 TO 0646 TOMATO FIELD	K	AC
077	S-C-8	MR-4	09/06/02	0624	395.30	0.00	0.03	BATTERY DEAD	K	AC
			09/05/02	0655	377.50	2.98	3.00	BATTERY DEAD	K	AC
078	SW-C-8	MC-4	09/06/02	0624	387.30	0.00	0.03	DATTERY DEAD	K	AC
			09/05/02	0705	287.20	2.98	3.00	BATTERY DEAD	K	AC
079	W-C-8	MO-4	09/06/02	0642	298.00	0.00	0.03		K	AC
			09/05/02	0712	182.30	2.98	3.00		K	AC
080	NW-C-8	MQ-4	09/06/02	0649	205.90	2.99	3.01		K	AC
			09/05/02	0719	299.20	2.98	3.00		K	AC
081	N-C-8	MX-4	09/06/02	0655	322.70	2.92	2.94	BATTERY LOW	K	AC
	1	10/4	09/05/02	0728	681.60	2.98	3.00 2.67	2.04	К	AC
082	NE-C-8	MV-4	09/06/02	0702	705.10	2.65		BATTERYLOW	K	AC
		1.11	09/05/02	0737	508.90	2.98	3.00	2.67	К	AC
083	E-C-8	MN-4	09/06/02	0709	532.40	2.30	2.33	2.4	K	AC
		·	09/05/02	0744	385.30	2.98	3.00	-	К	AC
084	E-C-8-C	MA-4	09/06/02	0714	408.80	2.84	2.86	BATTERY LOW	K	AC
			09/05/02	0753	168.80	2.98	3.00		K	AC
085	SE-C-8	MW-4	09/06/02	0720	189.00	2.43	2.46	2,73	 	
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		5063	Slope:	0.9978	Intercept:	0.0308				

Weather Codes: K = Clear, P = Partly Cloudy, $C = \ge 67\%$ Cloudy, F = Fog, and R = Rain (any)

Appendix VIII Methamidophos Field Log Sheets

Project: Methamidophos: Application Air Monitoring in San Joaquin County Project #: P-02-003 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
#	Name	ID	On	On	On	On	Flow		K,P,C,F&R	
		Number	Off	Off	Off	Off	18.00	ALC: The second second	Off	Off
001	S-M-B-FS	MR-3	09/02/02	0647	321.40	2.98	3.00	FIELD SPIKE	K	AC
001	3-1VI-D-1-3	10117-2	09/03/02	0559	344.60	2.85	2.87		K	AC
002	S-M-B	MR-4	09/02/02	0647	321.40	2.98	3.00		K	AC
002	O-IVI-D	10117-4	09/03/02	0559	344.60	2.85	2.87		K	AC
003	W-M-B-FS	MO-3	09/02/02	0701	221.30	2.98	3.00	FIELD SPIKE	K	AC
003	VV-IVI-D-F3	1010-3	09/03/02	0619	244.50	3.04	3.06		К	AC
004	W-M-B	MO-4	09/02/02	0701.	221.30	2.98	3.00		K	AC
004	VV-IVI-D	1010-4	09/03/02	0619	244.50	2.98	3.00		K	AC
205	N-M-B-FS	MX-3	09/02/02	0720	234.90	2.98	3.00	FIELD SPIKE	K	AC
005	N-IVI-D-P3	IVIX-3	09/03/02	0638	258.20	3.00	3.02		K	AC
COC	N-M-B	MX-4	09/02/02	0720	234.90	2.98	3.00		K	AC
006	IV-IVI-D	101/2-4	09/03/02	0638	258.20	2.98	3.00		K	AC
207	E-M-B-FS	MA-3	09/02/02	0749	315.80	2.98	1	FIELD SPIKE	K	AC
007	E-IVI-D-F3	IVIA-3	09/03/02	0659	339.00	2.99	3.01		K	AC
200	E-M-B	MA-4	09/02/02	0749	315.80	2.98	3.00		K	AC
008	E-IVI-D	10174-4	09/03/02	0659	339.00	3.00	3.02		K	AC
000	E-M-B-TS	N/A	09/02/02	2000	N/A	N/A	1	TRIP SPIKE	K	AC
009	E-M-D-19	14//-	N/A	N/A	N/A	N/A	#VALUE!		N/A	N/A
010	S-M-1	MR-3	09/03/02	0854	344.60	2.98		START OFAPPLICATION 920 PST	K	AC AC
010	O-IVI-1	IVII (-0	09/03/02	1124	347.10	2.81	2.83		K	AC AC
011	SW-M-1	MC-3	09/03/02	0900	332.90	2.98	3.00		K	
011	300-101-1	1010-0	09/03/02	1133	335.50	2.83	2.85		K	AC
012	W-M-1	M0-3	09/03/02	0907	244.50	2.98	3.00		K	AC
012	4 4-141- 1	1010-0	09/03/02	1140	247.10	2.84	2.86		K	AC
013	NW-M-1	MQ-3	09/03/02	0907	139.50	2.98	3.00		K	AC
013	1444-141-1	14106-0	09/03/02	1147	142.20	2.86	2.88		K	AC JW
014	N-M-1	MX-3 -	09/03/02	0909	258.20	2.98	3.00		K	
014	14-141-1	1717.0	09/03/02	1153	260.90	2.91	2.93		K	AC
015	NE-M-1	MV-3	09/03/02	0913	637.10	2.98	3.00		K	AC
015	1417-141-1	1414-0	09/03/02	1159	639.80	2.74	2.76		K	AC
016	E-M-1	MN-4	09/03/02	0916	464.50	2.98	3.00	:	K	AC
010	C-1V1- 1	MINA	09/03/02	1208	467.30	2.92	2.94		K	AC
047	E-M-1-C	MA-4	09/03/02	0916	339.00	2.98	3.00	<u> </u>	K	AC
017	E-1VI- 1-C	IVIZ	09/03/02	1207	341.80	2.90	2.92		K	AC
040	SE-M-1	MW-3	09/03/02	0920	123.20	2.98	3.00		K	AC
018	SE-IVI-I	1919 4-9	09/03/02	1220	126.20	2.88	2.90		K	AC

Project: Methamidophos Application Air Monitoring in San Joaquin County Project #: P-02-003 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler		Time	Counter	Flow	True	Comments	Weather	Initials
#	Name	ID	On	On	On	On	Flow		K,P,C,F&R	
711		Number	Off	Off	Off	Off			On	Off
019	S-M-2	MR-3	09/03/02	1125	347.10	2.98	3.00	END OF APPLICATION 1115 PST.	K	AC
019	J-1VI-2	1011 (-0)	09/03/02	1232	348.20	3.00	3.02		K	AC
020	SW-M-2	MC-3	09/03/02	1135	335.50	2.98	3.00		K	AC
020	344-141-2	1010-3	09/03/02	1241	336.60	3.00	3.02		K	AC
021	W-M-2	MO-3	09/03/02	1142	247.10	2.98	3.00		K	AC
021	V V - IVI-Z	1010-0	09/03/02	1250	248.20	2.99	3.01		K	AC
022	NW-M-2	MQ-3	09/03/02	1148	142.20	2.98	3.00		K	AC
UZZ	1444-141-2	יייטועו	09/03/02	1257	143.40	2.88	2.90		K	AC
023	N-M-2	MX-3	09/03/02	1153	260.90	2.98	3.00		K	AC
023	IN-IVI-Z	IVIX-3	09/03/02	1305	262.10	2.99	3.01		K	AC
024	NE-M-2	MV-3	09/03/02	1200	639.90	2.98	3.00		K	AC
024	INE-IVI-2	1010-2	09/03/02	1310	641.00	2.78	2.80	·	K	AC
025	E 14.2	MN-3	09/03/02	1213	467.40	2.98	3.00		K	AC
025	E-M-2	IVII4-9	09/03/02	1319	468.50	2.94	2.96		K	AC
000	E 14 0 0	140.2	09/03/02	1213	341.90	2.98	3.00		K	AC
026	E-M-2-C	MA-3	09/03/02	1322	343.00	2.97	2.99		K	AC
007	05.14.0	AAIA/ 2	09/03/02	1221	126.20	2.98	3.00		K	AC
027	SE-M-2	MW-3	09/03/02	1330	127.30	2.93	2.95		K	AC
020	S-M-3	MR-3	09/03/02	1234	348.20	2.98	3.00		K	AC
028	3-141-3	IVIX-3	09/03/02	1436	350.20	3.00	3.02		K	AC
000	CMANA	MC-3	09/03/02	1243	336.60	2.98	3.00		K	AC
029	SW-M-3	1410-3	09/03/02	1444	338.60	2.97	2.99		K	AC
020	WMA	MO-3	09/03/02	1251	248.30	2.98	3.00		K	AC
030	W-M-3	100-3	09/03/02	1451	250.20	2.92	2.94		K	AC
024	ANA/AA 2	MQ-3	09/03/02	1259	143.40	2.98	3.00		K	AC
031	NW-M-3	IVIQ-3	09/03/02	1457	145.40	2.81	2.83	,	K	AC
000	N1 N4 O	MX-3	09/03/02	1306	262.10	2.98	3.00		K	AC
032	N-M-3	IVIX-3	09/03/02	1504	264.10	2.95	2.97		K	AC
000	NIT M 2	MV-3	09/03/02	1313	641.10	2.98	3.00		K	AC
033	NE-M-3	1010-3	09/03/02	1510	643.10	2.96	2.98		K	AC
224	F.14.0	MANIO	09/03/02	1323	468.60	2.98	3.00		K	AC
034	E-M-3	MN-3	09/03/02	1518	470.50	2.95	2.97		K	AC
	= 1100	144.0	09/03/02	1325	343.10	2.98	3.00		K	AC /
035	E-M-3-C	MA-3	09/03/02	1523	345.10	2.98	3.00	Ī	K	AC
		1010	09/03/02	1332	127.40	2.98	3.00		К	AC
036	SE-M-3	MW-3	09/03/02	1530	129.30	2.98	3.00		ĸ	AC
	M Head #	5063	Slone:	0.9976	Intercept:	0.0308				لسسسسا

Project: Methamidophos Application Air Monitoring in San Joaquin County Project #: P-02-003 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
#	Name	ID	On	On	On	On	Flow		K,P,C,F&R	On
14 E	100 mm	Number	Off	Off	Off	Off	173		On	Off
037	S-M-4	MR-3	09/03/02	1436	350.30	2.98	3.00	4	K	AC
037	3-IVI-4	IVII\-0	09/03/02	1723	353.00	3.06	3.08		K	AC
038	SW-M-4	MC-3	09/03/02	1444	338.60	2.98	3.00	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	K	AC
038	3VV-IVI -4	1010-3	09/03/02	1732	341.40	2.99	3.01		K	AC
000	W-M-4	MO-3	09/03/02	1452	250.30	2.98	3.00		K	AC
039	VV-IVI-4	NO-3	09/03/02	1740	253.10	3.05	3.07		K	AC
242	ABA/ BA 4	MO 2	09/03/02	1459	145.40	2.98	3.00		K	AC
040	NW-M-4	MQ-3	09/03/02	1748	148.20	3.04	3.06		K	AC
244	1114	MV2	09/03/02	1506	264.10	2.98	3.00		K	AC
041	N-M-4	MX-3	09/03/02	1756	266.90	2.92	2.94		K	AC
	1 P 1 4	10/0	09/03/02	1512	643.10	2.98	3.00	· · · · · · · · · · · · · · · · · · ·	K	AC
042	NE-M-4	MV-3	09/03/02	1803	645.90	2.99	3.01		K	AC
		14110	09/03/02	1519	470.60	2.98	3.00		K	AC
043	E-M-4	MN-3	09/03/02	1812	473.40	3.04	3.06		K	AC
		144.0	09/03/02	1524	345.10	2.98	3.00		K	AC
044	E-M-4C	MA-3	09/03/02	1817	348.00	2.99	3.01		K	AC
		4444	09/03/02	1531	129.40	2.98	3.00		K	AC
045	SE-M-4	MW-3	09/03/02	1824	132.20	3.00	3.02		K	AC
	0.14.5	MD 2	09/03/02	1725	353.10	2.98	3.00		K	AC
046	S-M-5	MR-3	09/04/02	0635	366.20	3.04	3.06		K	AC
	0)4/1/5	140.0	09/03/02	1734	341.40	2.98	3.00		K	AC
047	SW-M-5	MC-3	09/04/02	0652	354.70	3.18	3.20		K	AC
	1441.5	110.0	09/03/02	1742	253.10	2.98	3.00		K	AC
048	W-M-5	MO-3	09/04/02	0704	266.50	3.09	3.11		K	AC
		140.0	09/03/02	1749	148.20	2.98	3.00		K	AC
049	NW-M-5	MQ-3	09/04/02	0714	161.60	2.98	3.00		K	AC
			09/03/02	1758	267.00	2.98	3.00		K	AC
050	N-M-5	MX-3	09/04/02	0721	280.30	3.03	3.05		K	AC
			09/03/02	1804	645.90	2.98	3.00		K	AC
051	NE-M-5	MV-3	09/04/02	0730	659.40	3.00	3.02		K	AC
			09/03/02	1814	473.50	2.98	3.00	16	K	AC
052	E-M-5	MN-3	09/04/02	0740	485.60	2.07	2.10	2.55	К	AC
			09/03/02	1818	348.00	2.98	3.00		K	AC /
053	E-M-5-C	MA-3 =	09/04/02	0747	361.40	3.03	3.05		K	AC
			09/03/02	1825	132.30	2.98	3.00		K	AC
054	SE-M-5	MW-3 -	09/04/02	0757	145.80	3.00	3.02	<u> </u>	K	AC
- 1			00/04/02	0/0/	1-1	0.00				

Project: Methamidophos Application Air Monitoring in San Joaquin County Project #: P-02-003 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler	Date	Time	Counter	Flow	True	Comments	Weather	Initials
#	Name	ID	On	On	On	On	Flow	Janaan ayan in argaman in argaman ay	K,P,C,F&R	
	e distribu	Number	Off	Off	Off	Off			On Off	Off
The state of the s		NIA	09/04/02	0520	NA	NA	#VALUE	TRIP SPIKE	K	SA
055	S-M-6-TS-1	NA	NA	N/A	NA	NA	#VALUE		K	SA
	0.14.0.70.0	214	09/04/02	0520	NA	NA	#VALUE	TRIP SPIKE	K	SA
056	S-M-6-TS-2	NA	NA	N/A	NA	NA	#VALUE		K	SA
	0140700	A.I.A.	09/04/02	0520	NA	NA	#VALUE!	TRIP SPIKE	K	SA
057	S-M-6-TS-3	NA	NA	N/A	NA	NA	#VALUE!		K	SA
	0.11.0.770	114	09/04/02	0530	NA	NA	#VALUE!	TRIP BLANK	K	SA
058	S-M-6-TB	NA	NA	N/A	NA	NA	#VALUE!	:	K	SA
	0.14.0	145.0	09/04/02	0637	366.20	2.98	3.00	4	K	AC
059	S-M-6	MR-3	09/04/02	1727	377.10	2.84	2.86	`	K	JW
	014/14/0	140.0	09/04/02	0654	354.80	2.98	3.00	·	K	AC
060	SW-M-6	MC-3	09/04/02	1738	365.50	2.83	2.85	: *	K	JW
	14/14/0	140.0	09/04/02	0707	266.50	2.98	3.00		K	AC
061	W-M-6	MO-3	09/04/02	1754	277.30	2.92	2.94		K	JW
	171/1/0	140.0	09/04/02	0715	161.60	2.98	3.00	DEAD BATTERY	K	AC
062	NW-M-6	MQ-3	09/04/02	1803	171.70	0.00	0.03		K	JW
	11110	1474.0	09/04/02	0724	280.40	2.98	3.00		- K	AC
063	N-M-6	MX-3	09/04/02	1811	291.10	2.90	2.92	. }	K	JW
224	NIT M C	MV-3	09/04/02	0732	659.40	2.98	3.00		K	AC
064	NE-M-6	1010-3	09/04/02	1819	670.20	2.88	2.90		K	JW
005	EM6	MN-3	09/04/02	0742	486.00	2.98	3.00	:	K	AC
065	E-M-6	IVIIV-3	09/04/02	1828	496.70	2.89	2.91		K	JW
200	F.14.6.0	MA	09/04/02	0750	361.50	2.98	3.00	. :	K	AC
066	E-M-6-C	MA-3	09/04/02	1834	372.70	2.84	2.86		K	JW
207	OF M.C	1414/2	09/04/02	0759	145.80	2.98	3.00		K	AC
067	SE-M-6	MW-3	09/04/02	1843	156.50	2.92	2.94		Κ .	JW
222	0117	MD 2	09/04/02	1730	377.10	2.98	3.00	DEAD BATTERY	K	JW
068	S-M-7	MR-3	09/05/02	0643	389.00	0.00	0.03		K	AC
	0)4/44.7	140.2	09/04/02	1741	365.50	2.98	3.00	LOW BATTERY	K	JW
069	SW-M-7	MC-3	09/05/02	0653	377.50	2.17	2.20		K	AC
	101217	140.2	09/04/02	1758	277.30	2.98	3.00	DEAD BATTERY	K	JW
070	W-M-7	MO-3	09/05/02	0702	287.20	0.80	0.83		K	AC
	10000	140.0	09/04/02	1806	171.70	2.98	3.00	DEAD BATTERY	K	JW
071	NVV-M-7	MQ-3	09/05/02	0709	182.30	0.40	0.43		K	AC
	1	147/ 2	09/04/02	1814	291.20	2.98	0.00	DEAD BATTERY	K	JW
072	N-M-7	MX-3 -	09/05/02	0716	299.10	0.00	0.03		K	AC
		F000	Clana	0.0076	Intercents	0.0308				

Project: Methamidophos Application Air Monitoring in San Joaquin County Project #: P-02-003 On Flow: 3.00 ±0.02lpm Off Flow: 3.00 lpm ±10%

Log	Sample	Sampler		Time	Counter	Flow	True	Comments		
#	Name	al di	On ·	On	On	On	Flow		K,P,C,F&R	On
		Number	Off	Off	Off	Off			On	Off
073	NE-M-7	MV-3	09/04/02	1823	670.20	2.98	3.00	DEAD BATTERY	K	JW
073	14C-101-7	1010-3	09/05/02	0725	681.60	0.00	0.03		K	AC
074	E-M-7	MN-3	09/04/02	1832	496.80	2.98	3.00	LOW BATTERY	K	JW
0/4	E-IVI-7	10114-2	09/05/02	0734	508.90	1.61	1.64		K	AC
075	E-M-7-C	MA-3	09/04/02	1838	372.20	2.98	3.00		K	JW
075	L-1VI-7-C	101/1-0	09/05/02	0742	385.30	2.89	2.91		K	AC
076	SE-M-7	MW-3	09/04/02	1847	156.60	2.98	3.00	DEAD BATTERY	K	JW
0/6	SE-IVI-7	10100-3	09/05/02	0750	168.80	0.00	0.03		K	AC
077	S-M-8	MR-3	09/05/02	0645	389.00	2.98	3.00	AERIEL SPRAYING IN FIELD 1300' DUE WEST	K	AC
0//	Q-1VI-0	IVII\-3	09/06/02	0624	395.30	0.00	0.03	0636 TO 0646. TOMATOE FIELD, DEAD BAT	K	AC
078	SW-M-8	MC-3	09/05/02	0655	377.50	2.98	3.00	DEAD BATTERY	K	AC
0/0	344-141-0	1410-0	09/06/02	0624	387.30	0.00	0.03		K	AC
079	W-M-8	МО-3	09/05/02	0705	287.20	2.98		DEAD BATTERY	K	AC
0/9	VV-1V1-O	1410-0	09/06/02	0642	298.00	0.00	0.03		K	AC
080	NW-M-8	MQ-3	09/05/02	0712	182.30	2.98	3.00		K	AC
000	1444-141-0	IVICE	09/06/02	0649	205.90	2.93	2.95		K	AC
081	N-M-8	MX-3	09/05/02	0719	299.20	2.98	3.00		K	AC
			09/06/02	0655	322.70	2.93	2.95	LOWBATTERY	K	AC
082	NE-M-8	MV-3	09/05/02	0728	681.60	2.98		LOW BATTERY	K	AC
			09/06/02	0702	705.10	2.79	2.81	LOW BATTERY	K	AC
083	E-M-8	MN-3 -	09/05/02	0737	508.90	2.98		2.(A	K	AC
			09/06/02	0709	532.40	2.33	2.36	7,40	K	AC
084	E-M-8-C	MA-3	09/05/02	0744	385.30	2.98	3.00		K	AC
			09/06/02	0714	408.80	2.90	2.92	LOW BATTERY	K	AC
085	SE-M-8	MW-3	09/05/02	0753	168.80	2.98		179	K	AC
			09/06/02	0720	189.00	2.55	2.57	217	К	AC
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يليـــــ	M Used #:	5036	Slope:	0.9976	Intercept:	0.0308		<u></u>		

Appendix IX

Standard Operating Procedure
Sampling and Analysis of 2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
(Chlorothalonil) in Ambient Air

California Environmental Protection Agency

Air Resources Board

Standard Operating Procedure
Sampling and Analysis of 2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
(Chlorothalonil) in Ambient Air

Special Analysis Section Northern Laboratory Branch Monitoring and Laboratory Division

July 23, 2003

Version 1

Approved by:

Russell Grace, Manager Special Analysis Section

1. SCOPE

This is a gas chromatography/mass selective detector (GC/MSD) method for determination of 2,4,5,6-tetrachloro-1,3-benzenecarbonitrile (chlorothalonil) from ambient air samples. The method was adapted from the California Air Resources Board Standard Operating Procedure for the Analysis of Chlorothalonil in Ambient Air dated January 1992. The Department of Pesticide Regulation (DPR) request estimate quantitation limit (EQL) for Chlorothalonil is one (1) nanogram per cubic meter (ng/m³). The EQL achieved using this SOP is 2.25 ng/m³.

2. SUMMARY OF METHOD

Ambient air is collected on XAD-2 cartridges. Sample cartridges are stored at four (4) degrees centigrade (°C) before extraction. Samples cartridges are extracted using methylene chloride and an ultrasonic bath. Sample analysis is performed using a GC/MSD in the selected ion-monitoring mode (SIM). Sample analysis and quantitation uses the internal standard Aldrin ¹³C₄, which is added to each extract prior to GC/MSD analysis. Estimated quantitation levels for this method range from approximately 2.5 nanogram per cubic meter to 90 nanogram per cubic meter (ng/m³) prior to sample dilution.

3. INTERFERENCES / LIMITATIONS

Method interference may be caused by contaminants in solvents, reagents, glassware and the XAD-2 cartridges that can lead to discrete artifacts or elevated baselines. Analysis of samples containing high concentrations of early eluting pesticide components may cause significant contamination of the analytical equipment. Both a system blank and extraction blank must be analyzed with each batch of samples to detect any possible method or instrument interference.

4. EQUIPMENT AND CONDITIONS

A. Instrumentation

Hewlett Packard 5890 Series II gas chromatograph:

Detector: 300° C Injector: 250° C

Column: Restek Rtx-5MS, 30 meters, 0.32 mm i.d., 0.25 µm film thickness, or

equivalent

Temperature Program:

Initial Temperature: 50° C for 1 minute

Ramp 1: 50 to 175° C at 50° C per minute hold for 1 minute Ramp 2: 175 to 250° C at 25° C per minute hold for 0 minutes

Final Ramp: 250 to 300° C at 50° C per minute hold for 3 minutes

Splitter opens at 1.0 minute

Carrier gas: Helium at 1.5 ml/minute constant flow mode

Hewlett Packard 5972 mass selective detector:

Acquisition Mode: SIM

Masses: 264, 266, and 268 for chlorothalonil from 5 to 7.45 minutes

Masses: 265, 267, 269 for Aldrin ¹³C₄ from 7.45 to 12 minutes

Tune File: PFTBA Autotune at maximum sensitivity

B. Auxiliary Apparatus

XAD-2 cartridges (SKC cat # 226-30-6) or equivalent Glass amber vials, 2-ml capacity with septum caps Sonicator

C. Reagents

Methylene Chloride (B&J brand pesticide grade or equivalent) Acetone (B&J brand reagent grade or equivalent) Chlorothalonil 98.5% pure (Chem Service Inc. PS-1020) Aldrin $^{13}\text{C}_4$ 99% pure, 100 µg/ml (Cambridge Isotopes Laboratories Inc. CLM-3347)

D. Gases

Compressed Helium Grade 5 or better

5. SAMPLE COLLECTION

- a) Samples are collected in the field with a maximum flow rate of three (3) liters per minute (lpm).
- b) After collection the samples are place in a glass tube and stored in a cooler at 4° C or less until extracted.
- c) According to EPA method TO-10A the cartridges should be extracted within seven (7) days. An analyte specific holding time was determined. Chlorothalonil is stable for at least 24 days when kept at -30°C. See section 8F for storage stability summary.

6. SAMPLE EXTRACTON

- a) Prepare a method blank and laboratory control sample (LCS) cartridge with every batch of field samples not to exceed twenty (20) samples in an analytical batch.
- b) Using a ten (10) microliter syringe, spike the XAD-2 resin in the LCS cartridge with 50 ng of Chlorothalonil.
- c) Carefully score and break the XAD-2 cartridge just above the glass wool plug and spring on the primary section.
- d) Remove the glass wool plug using forceps.
- e) Pour the XAD-2 resin from the primary section into the glass vial.
- f) Carefully score and break the XAD-2 cartridge just above the glass wool plug on the secondary section.
- g) Carefully using 3.0 ml of methylene chloride rinse the inside of the primary section into the glass vial. Cap tightly.
- h) Retain the secondary section for later analysis to check for breakthrough.
- i) Place all the vials in an ultrasonic bath and sonicate for 30 to 45 minutes.
- j) Filter the extract through a 2.7-micron filter into a second vial and store at 4°C until ready for analysis.

7. ANALYSIS OF SAMPLES

- a) Transfer 1.0 ml of the sample extract to a 1.5-ml amber autosampler vial. Add 30 ng of internal standard (Aldrin ¹³C₄). Sample extract is now ready for analysis.
- b) Prior to sample analysis perform a PFTBA autotune using the maximum sensitivity tune option. Evaluate the tune using the criteria listed in Appendix
 1. If the tune does not meet the criteria, retune. If the tune continues to be unsuccessful, perform corrective maintenance and then retune.
- c) Perform an initial calibration curve using concentrations at or near the EQL to approximately 30 times higher. At least five points must be analyzed to establish a calibration curve. Appendix 2 lists the concentrations used when the EQL is approximately 3 ng/m³.
- d) Prepare a sample sequence for the GC/MSD. The sequence should include a continuing calibration verification standard (CCV), and a system blank, for every ten samples analyzed. If this batch of samples includes a method blank and /or LCS, they should be run prior to field samples to verify that QC criteria have been met.
- e) Because of the nature of the XAD-2 cartridge, extraneous components will be extracted along with the analytes of interest. To minimize excessive carry over of these contaminants from one analysis to the next, a system blank should be run after every five to ten samples or more frequently if indicated by sample chromatograms. In no case should a sample contaminant

interfere with the peaks of interest. This will be verified by the absence of a peak in the analyte retention time window during the system blank analysis.

- f) A 2-µl injection volume will be used for all analyses.
- g) Review and edit the quantitation reports as needed.
- h) The samples must be diluted if the analytical results are not within the calibration curve. Every attempt should be made to have the diluted results fall within the upper half of the calibration curve.
- The final results will be adjusted by an appropriate dilution factor and reported in ng/ml.
- j) The atmospheric concentration is calculated according to:

Ambient Sample Conc $(ng/m^3) = \frac{\text{Extract Conc } (ng/ml) \times 3 \text{ ml}}{\text{Air Volume Sampled } (m^3)}$

k) Given instrument sensitivity and a maximum sample of 4.3 m³ the EQL for this method will be approximately 2.5 ng/m³.

8. QUALITY ASSURANCE

A. Instrument Reproducibility

Establish the reproducibility of the instrument and analytical method as follows: Analyze three different concentrations of standard (low, medium, and high levels) by analyzing each five times

B. Linearity

A six-point calibration is performed. Calibration standards ranging from at or near the EQL to approximately 30 times higher are used for Chlorothalonil. The results are used to calculate calibration curves using linear or quadratic regression. A r² of 0.995 or higher is required for an initial calibration to be acceptable. See Appendix 2 for an example calibration curve. A CCV will be run at the start of each analytical batch, and after every tenth sample to verify the system linearity. The CCV quantitated value must be within 25% of the actual value.

C. Method Detection Limit

Method detection limits (MDL) are based on the US EPA MDL calculation. Using the analysis of seven replicates of a low-level standard, the MDL and EQL for Chlorothalonil are calculated as follows:

MDL = 3.143*STD

EQL = 5*MDL

Where STD equals the standard deviation of the calculated results for the seven replicate spikes. The calculated MDL for Chlorothalonil is 0.4487 ng/m³. The EQL for Chlorothalonil using a three-ml extraction volume and a sample collection volume of 4.3 m³ is 2.25 ng/m³.

D. Laboratory Control Sample

A laboratory control sample (LCS) is included with each analytical batch. The LCS stock standard should come from a different source or lot than the daily calibration standards. The analytical value of the LCS must be within three standard deviations of it's historical mean. If the LCS is outside of limits then the samples in the analytical batch must be reanalyzed.

E. Collection and Extraction Efficiency (Recovery)

Collection and extraction efficiency for Chlorothalonil should be determined at concentrations representing the expected range of sample concentrations to be collected during field sampling. If sample concentrations are unknown, choose two levels, one at the low end and one at the high end of the calibration curve.

F. Storage Stability

Storage stability studies were performed in triplicate using 52 ng Chlorothalonil spiked on the primary section of XAD-2 cartridges. The study was run for 24 days with cartridges being tested approximately every seven days. Analyte recovery at the end of the study was determined to be 106 + 4.6%.

G. Breakthrough

Three XAD-2 cartridges were spiked with 1 µg of Chlorothalonil to evaluate analyte breakthrough. Air was collected at approximately 3 lpm for 24 hours. Chlorothalonil was not detected in the back section of the XAD-2 cartridges. Average recovery for Chlorothalonil from the front sections was 92%.

H. Safety

This procedure does not address all of the safety concerns associated with chemical analysis. It is the responsibility of the analyst to establish appropriate safety and health practices. For hazard information and guidance refer to the material safety data sheets (MSDS) of any chemicals used in this procedure.

Appendix 1

Autotune Criteria

A maximum sensitivity autotune should be performed on the detector each day prior to sample analysis. The autotune report should be evaluated for the following:

- 1. Any unusual change in the EM voltage
- 2. Peak width for all tune masses should be between 0.4 amu and 0.6 amu.
- 3. The relative abundance of tune mass 219.0 should be greater than 25% of tune mass 69.0
- Isotope abundance ratio for tune mass 70.0 should between 0.54% and 1.6%; isotope abundance ratio for tune mass 220.0 should be between 3.2% and 5.4%.
- 5. Masses 28 and 18 should be evaluated to check for air leaks in the system.

If autotune criteria are not met the system should be evaluated for problems. After the system problems are corrected the detector should be autotuned prior to sample analysis. Autotune reports should be filed in the instrument autotune folder.

Appendix 2

Calibration Standard Preparation for Chlorothalonil

The certified neat standard used for calibration was purchased from Chem Service Inc., West Chester, Pennsylvania and has the following specification:

Lot No:

276-95A

Expiration date:

February 2007

Chlorothalonil

98.5% pure (solid)

A stock standard with a concentration of approximately 1-milligram (mg) per ml was prepared by weighing 25 mg of chlorothalonil into a 25 ml volumetric flask and bringing to volume with methylene chloride.

Using a serial dilution technique the following calibration standards were prepared in methylene chloride: 3.04, 6.03, 15.0, 31.2, 62.4, 93.6, and 124.8 ng/ml.

A minimum of six standards was used to generate the calibration curve, with the standard at 3.04 ng/ml being the low point. The low point equates to approximately 2.12 ng/m³.

All standard and sample injection used a volume of 2 µl.

Initial calibration curve acceptance requires a r² of at least 0.995.

Appendix X

Standard Operating Procedure for the Sampling and Analysis of Methamidophos and Acephate in Ambient and Application Air Monitoring

California Environmental Protection Agency

Air Resources Board

Standard Operating Procedure for the
Sampling and Analysis of Methamidophos and Acephate in
Ambient and Application Air Monitoring using Gas
Chromatography with a Nitrogen-Phosphorus Detector and a
Flame Photometric Detector

Special Analysis Section Northern Laboratory Branch Monitoring and Laboratory Division

DRAFT 06/12/02 version

Approved by:

Russell Grace, Manager Special Analysis Section

1. SCOPE

The method uses XAD-2 resin cartridges and a gas chromatograph with a nitrogen-phosphorus detector (NPD) and a flame photometric detector (FPD) for the determination of methamidophos and acephate for ambient and application air sample analysis. The Department of Pesticide Regulation (DPR) asked the Air Resources Board (ARB) to do ambient and application monitoring of methamidophos and acephate at a requested quantitation limit of 1 ng/m³ and 5 ng/m³, respectively, for ambient and 0.05 $\mu g/m³$ and 0.1 $\mu g/m³$, respectively, for application.

2. SUMMARY OF METHOD

XAD-2 resin cartridges are placed on the sampler for 24 hours at three (3) liters per minute (LPM) flow rate. The samples are stored in an ice chest or refrigerator until extracted with 3 milliliters (ml) of 10% acetone in ethyl acetate (EA). The method uses diazinon as an internal standard. The injection volume is 3 microliters (μ l). A gas chromatograph with dual injection system, dual column, and dual detectors is used for analysis. This method allows for confirmation analysis of the target compounds.

3. INTERFERENCES/LIMITATIONS

As with any method, interferences may be caused by contaminants in solvents, reagents, glassware and other processing apparatus that can lead to discrete artifacts or elevated baselines. Method blanks, both solvent and resin, must be run concurrently with each analytical sample batch to detect possible interferences.

4. EQUIPMENT AND CONDITIONS

A. INSTRUMENTATION:

Hewlett-Packard 5890 Plus II Series gas chromatograph, with a nitrogen-phosphorus detector (NPD) and flame photometric detector (FPD).

Hewlett-Packard 6890 Enhanced Parameters automated liquid samplers (ALS) for front and rear injection ports.

Front Column: Restek Rtx-OPPesticides, 30 meter, 320 μm i.d., 0.5 μm film thickness (NPD).

Back Column: Restek Rtx-1, 30 meter, 530 μm i.d., 0.5 μm film thickness (FPD).

GC Temperature Program: Oven initial 90 °C, hold 1 minute. Ramp to 260 °C @ 10 °C/min, hold for 1 minute.

Retention time:

RT-OP, NPD: methamidophos=8.55 min; acephate=11.68 min; and diazinon=13.06 min. RTx-1; FPD: methamidophos=4.47 min; acephate=6.78 min; and diazinon=11.13 min.

Flows: RT-OP Column: He, 1.6 ml/min, 14.0 psi. (velocity: 44cm/sec) RTx-1 Column: He, 6.5 ml/min, 5.6 psi. (velocity; 49.8 cm/sec).

Injector: Splitless, 220° C, front and back.

Detector Temperature: NPD, 300°C; FPD, 250°C

- B. Auxiliary Apparatus
- 1. Precleaned vials, 8 ml capacity with teflon caps.
- 2. XAD-2, 400/200 mg, SKC #226-30-06
- 3. Sonicator
- 4. GC vials with septum caps.
- 5. 250 μl inserts for GC vials.
- C. Reagants
- 1. Ethyl Acetate, Pesticide grade or better.
- 2. Acetone, HPLC grade
- 3. Methamidophos, Chem Service PS-676
- 4. Acephate, Chem Service PS-738
- 5. Diazinon, Chem Service PS-90, as the internal standard

5. ANALYSIS OF SAMPLES

- 1. It is necessary to analyze a solvent blank and an XAD-2 blank with each batch of samples. The blanks must be free of interferences in the targeted regions of the analytes. A solvent blank is analyzed after every tenth sample and after any sample that may result in possible carry-over contamination.
- 2. A six (6)-point calibration curve shall be analyzed with each batch of samples. For methamidophos the calibration is at 5.0, 10.0, 20.0, 40.0, 60.0, and 100.0 ng/ml. For acephate the calibration is at 15.0, 30.0, 60.0, 80.0, 100.0, and 150.0 ng/ml. Diazinon, the internal standard, is at a concentration of 50 ng/ml. The calibration is run prior to each analytical sample batch. The analytical sample batch consists of the samples analyzed on the GC for any given day.
- 3. With each batch of samples analyzed, a laboratory resin blank and a laboratory resin control spike will be run concurrently. A laboratory blank is an unexposed XAD-2 cartridge prepared and analyzed the same way the samples are analyzed. A laboratory control spike is a XAD-2 cartridge spiked with a known amount of the target compounds. The laboratory control sample is prepared and analyzed the same way as the samples. Laboratory control samples should have recoveries that are at least 70% of the theoretical spiked value.
- 4. A calibration control check for methamidophos at 70.0 ng/ml and acephate at 100.0 ng/ml is run after the calibration and every 10 samples and at the end of each sample batch. The value of the check must be within ±3σ (the standard deviation) or ±15% of the expected value whichever is greater. If the calibration check is outside the limit, then those samples in the batch after the last acceptable calibration check need to be reanalyzed.
- 5. The exposed XAD-2 is transferred into an 8 ml vial. To the vial add 3.0 ml of 10%acetone/EA. Cap and place the vial in the sonicator for 1 hour.

- 6. Transfer a one(1) ml aliquot of the sample into a GC vial. Add 5 μ l of 10.0 ng/ml diazinon. Refrigerate the remaining portion for re-analysis if necessary.
- 7. Aliquot the sample into two GC vials containing a 250 μ l insert. The GC vials are placed on the automatic liquid sampler tray for simultaneous analysis by the NPD and FPD.
- 8. The results are reported as ng/sample.
- 9. The atmospheric concentration is calculated according to:

Conc (μ g/m³) = Extract Conc (μ g/m³) X 3 ml / Air Volume Sampled (m³)

6. QUALITY ASSURANCE

A. Instrument Reproducibility

The reproducibility of the instrument, analytical method, and both detectors was established by analyzing five(5) 3.0 μ l injections of methamidophos and acephate standard at three concentrations (low, mid, and high range). The low, mid and high concentrations for methamidophos were 5.0, 40.0 and 100.0 μ g/ml. The concentrations for acephate were 15.0, 80.0 and 150.0 ng/ml. The corresponding internal standard response is also recorded. (Table 1)

B. Calibration

The six-point calibration curve is constructed using linear regression analysis. A curve cannot be used if its correlation coefficient is less than 0.995. The calibration is run for both detectors.

C. Calibration Check

A calibration check control is run after the calibration and every 10 samples and at the end of the sample batch to verify the system is in calibration. The value of the check must be within $\pm 3\sigma$ (the standard deviation) or $\pm 15\%$ of the expected value, whichever is greater. If the calibration check is outside the limit, then those samples preceding the out of limit check need to be reanalyzed.

D. Minimum Detection Limit

Detection limits are based on US EPA MDL calculation. Using the analysis of seven (7) replicates of a low-level XAD-2 spike, the method detection limit (MDL) and the estimated quantitation limit (EQL) for methamidophos and acepate is calculated by: MDL = 3.14*(std dev values), where std dev = the standard deviation of the concentration calculated for the seven replicate spikes. The analytical results are reported with the low calibration standard corresponding to the requested EQL. Data above the requested EQL is reported to 3 significant figures. Results below the requested EQL but above the MDL are reported as DET (detected) and results less than the MDL are ND (nondetect).

E. Collection and Extraction Efficiency (Recovery)

Methamidophos and acephate at a low and high level are spiked on XAD-2 cartridges (4 at each concentration). The spiked tubes are placed on field samplers with airflows of 3 LPM for 24 hours. The samples are extracted with 10%Acetone/EA and prepared as described in section 5. The average percent recovery should be ± 20% of the expected value. [on going]

F. Storage Stability

[on going]

G. Breakthrough

[on going]

H. Safety

This procedure does not address all of the safety concerns associated with chemical analysis. It is the responsibility of the analyst to establish appropriate safety and health practices. For to the material safety data sheets (MSDS) of any chemicals used in this procedure hazard information and guidance refer.

Table 1: Instrument Reproducibility: NPD

Standard	Methamidophos ng/ml	Height Response	Standard	Acephate ng/ml	Height Response		Diazinon Height Response
5 ng/ml	5.68	402	15 ng/ml	16.2	580		4397
	5.69	417		16.3	606		4540
	5.59	394		16.3	590		4405
	5.32	366		15.6	553		4395
	5.47	379		16.0	570		4384
Average	5.55	392	Average	16.08	580	Average	4424
Standard Dev	0.16	20	Standard Dev	0.29	20	Standard Dev	65
Relative STD	2.81	5	Relative STD	1.83	3	Relative STD	11
40 ng/ml	36.4	3530	80 ng/ml	74.8	3634		4485
40 fig/fill	36.5	3448		75.0	3543		4360
	36.9	3668		73.1	3622		4586
	37.5	3673		73.2	3577		4518
	36.2	3513		70.6	3414		4486
Average	36.70	3566	Average	73.34	3558	Average	4487
Standard Dev	0.51	100	Standard Dev	1.77	88	Standard Dev	82
Relative STD	1.40	3	Relative STD	2.41	2	Relative STD	2
100 ng/ml	105.5	10261	150 ng/ml	145.7	7103		4357
100 lig/illi	100.8	9674		147.2	7080		4299
	107.2	9852		148.0	6820		4117
	103.5	10161		149.1	7342		4398
	96.4	10782		140.5	7870		5016
Average	102.68	10146	Average	146.10	7243	Average	4437
Standard Dev	4,24	426	Standard Dev	3.37	396	Standard Dev	341
Relative STD	4.13	4	Relative STD	2.30	5	Relative STD	8

Table 1: Instrument Reproducibility: FPD

Standard	Methamidophos Amount	Height Response	Standard	Acephate Amount	Height Response		Diazinon Height Response
F = e/ml	8.42	3372	15 ng/ml	20.1	6098		6211
5 ng/ml	8.29	3028		19.3	5271		60204
	8.58	3026		19.8	5762		60945
	7.96	2510		18.9	5069		62508
	7.99	2504		18.9	5002		61102
	0.40	2888	Average	19.4	5440	Average	61368
Average	8.19	375	Standard Dev	0.54	473	Standard Dev	933
Standard Dev Relative STD	0.20 2.47	13	Relative STD	2.78	9	Relative STD	2
(Clative of D	· -				10700		63025
40 ng/ml	32.8	50746	80 ng/ml	65.3	46799		60639
	34.1	51285		70,5	49496		62730
	34.0	52935		69.0	49937	<u> </u>	62602
	33.1	51029		66.4	47496		
	33.5	51792		65.7	46818		62533
Average	33.5	51557	Average	67.4	48109	Average	62306
Standard Dev	0.56	861	Standard Dev	2.26	1502	Standard Dev	951
Relative STD	1.68	2	Relative STD	3.36	3	Relative STD	2
					10011	<u> </u>	60716
100 ng/ml	99.6	17387	150 ng/ml	152.0	12014		61545
	100.6	17813		158.7	12765		62256
	97.0	17332		150.4	12180	<u> </u>	62438
	96.8	17346		145.5	11780		
	99.0	16662		145.0	11004		58554
Averege	98.6	17308	Average	150.32	11949	Average	61102
Average Standard Dev	1.66	412	Standard Dev	5.58	641	Standard Dev	1578
Relative STD	1.68	2	Relative STD	3.71	5	Relative STD	3